

98-84375-5

U.S. Congress. House.

Creating a board of  
adjustment and board...

Washington

1922

98-84375-5  
MASTER NEGATIVE #

COLUMBIA UNIVERSITY LIBRARIES  
PRESERVATION DIVISION

BIBLIOGRAPHIC MICROFORM TARGET

ORIGINAL MATERIAL AS FILMED - EXISTING BIBLIOGRAPHIC RECORD

309

Z

Box 630 U. S. Congress. House. Committee on labor.

Creating a board of adjustment and board of appeals for employees of navy yards and arsenals. Hearings before the Committee on labor, House of representatives, Sixty-seventh Congress, second session, on H. R. 11956, a bill to create a board of adjustment which shall constitute a wage board and board of appeals for employees of navy yards and arsenals, and to define its powers and duties. Friday, June 30, 1922. Washington, Govt. print. off., 1922.

ii, 70 p. incl. tables, diagrs. 23<sup>1</sup>/<sub>2</sub>cm.

(Continued on next card)

23-1095

151

RESTRICTIONS ON USE: Reproductions may not be made without permission from Columbia University Libraries.

TECHNICAL MICROFORM DATA

FILM SIZE: 35mm

REDUCTION RATIO: 11:1

IMAGE PLACEMENT: IA ☒ IIA IB IIB

DATE FILMED: 3-31-98

INITIALS: BT

TRACKING # : 31819

FILMED BY PRESERVATION RESOURCES, BETHLEHEM, PA.

## BIBLIOGRAPHIC IRREGULARITIES

MAIN ENTRY: U.S. Congress. House. \_\_\_\_\_

Creating a board of adjustment and board of appeals  
for employees of navy yards and arsenals \_\_\_\_\_

### **Bibliographic Irregularities in the Original Document:**

List all volumes and pages affected; include name of institution if filming borrowed text.

\_\_\_\_\_ Page(s) missing/not available: \_\_\_\_\_

\_\_\_\_\_ Volume(s) missing/not available: \_\_\_\_\_

\_\_\_\_\_ Illegible and/or damaged page(s): \_\_\_\_\_

\_\_\_\_\_ Page(s) or volume(s) misnumbered: \_\_\_\_\_

\_\_\_\_\_ Bound out of sequence: \_\_\_\_\_

X \_\_\_\_\_ Page(s) or volume(s) filmed from copy borrowed from: Hoover Institution  
(p. 68 - end)

\_\_\_\_\_ Other: \_\_\_\_\_

\_\_\_\_\_ Inserted material: \_\_\_\_\_

TRACKING#: MSH31819

FILMED IN WHOLE  
OR PART FROM A  
COPY BORROWED  
FROM:  
HOOVER  
INSTITUTION

CREATING A BOARD OF ADJUSTMENT AND BOARD OF APPEALS  
FOR EMPLOYEES OF NAVY YARDS AND ARSENALS

---

HEARINGS  
BEFORE  
THE COMMITTEE ON LABOR

HOUSE OF REPRESENTATIVES

SIXTY-SEVENTH CONGRESS

SECOND SESSION

ON

**H. R. 11956**

A BILL TO CREATE A BOARD OF ADJUSTMENT WHICH SHALL  
CONSTITUTE A WAGE BOARD AND BOARD OF APPEALS  
FOR EMPLOYEES OF NAVY YARDS AND ARSENALS,  
AND TO DEFINE ITS POWERS AND DUTIES

---

FRIDAY, JUNE 30, 1922



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1922

COMMITTEE ON LABOR  
HOUSE OF REPRESENTATIVES.  
SIXTY-SEVENTH CONGRESS.

JOHN I. NOLAN, California, *Chairman*.

FREDERICK N. ZIHLMAN, Maryland.  
MORMAN J. GOULD, New York.  
OSCAR E. BLAND, Indiana.  
WILLIAM J. BURKE, Pennsylvania.  
WILLIAM O. ATKESON, Missouri.  
JOSEPH D. BECK, Wisconsin.  
CHARLES L. KNIGHT, Ohio.  
JOHN E. NELSON, Maine.

EUGENE BLACK, Texas.  
WILLIAM D. UPSHAW, Georgia.  
ROSS A. COLLINS, Mississippi.  
GEORGE K. FAYROT, Louisiana.  
MEYER LONDON, New York.

T. C. GLYNN, *Clerk*.

CREATING A BOARD OF ADJUSTMENT AND BOARD OF APPEALS  
FOR EMPLOYEES OF NAVY YARDS AND ARSENALS.

COMMITTEE ON LABOR,  
HOUSE OF REPRESENTATIVES,  
Friday, June 30, 1922.

The committee this day met, Hon. Frederick N. Zihlman presiding.

Mr. ZIHLMAN. The committee will be in order. Without objection, the roll call will be dispensed with. I will state to the members present that this meeting has been called for the purpose of giving those favoring H. R. 11956 an opportunity of presenting their views on the legislation before the committee. If there is no objection, a copy of the bill will be inserted at this point. (Said bill follows:)

[H. R. 11956, Sixty-seventh Congress, second session.]

A BILL To create a board of adjustment which shall constitute a wage board and board of appeals for employees of navy yards and arsenals, and to define its powers and duties.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there is hereby created and established a navy yard and arsenal board of adjustment, hereinafter referred to as the "board," which shall be composed of twelve members, three of whom shall be appointed by the Secretary of War, three by the Secretary of the Navy, and six members who shall be chosen in such manner as the civilian employees affected by this act may determine. In the event of a vacancy in the membership from any cause, the same shall be immediately filled by the same appointive authority as in the original appointment. Within sixty days after the passage of this act the board shall meet and organize by choosing from among its members a chairman, vice chairman, and a secretary, who shall serve as such for a period of one year.

Sec. 2. That no member of the board shall receive compensation, but all clerical and office expenses of the board shall be paid by the United States Government.

Sec. 3. That the board shall annually, on the first day of January, establish a fair and reasonable wage and salary schedule, to include all classes of employees of the navy yards and arsenals, and said schedule shall be effective for one year.

In determining the justness and reasonableness of such wage schedule, the board shall take into consideration as relevant factors the following:

- (a) The maintenance of a standard of living for the worker and his family which will insure health and decency;
- (b) The relation between wages and the cost of living;
- (c) The average change in per capita productivity of manufacturing industries in the United States over a period covering the preceding ten years;
- (d) The progress made in per capita production in manufacturing in the United States since 1900 which has not already been reflected in increased wages;
- (e) The training and skill required;
- (f) The degree of responsibility; and
- (g) Inequalities of increases in wages or of treatment the result of previous wage orders or adjustments.

The board shall cause due notice to be given on or about October 1 of each year of the time and place where hearings will be held, and due opportunity shall be given the representatives of the employees to present their claims.

Sec. 4. That personal and general grievances or controversies, arising over interpretations of wage awards, wage and salary laws, and all other disputes

arising over conditions of employment and interpretations of laws, Executive orders of the President, and departmental regulations and orders concerning conditions of employment between officials of offices, bureaus, divisions, or departments and their employees, shall first be taken up through official channels by employees, committees of the employees, or representatives of the employees up to and including the chief official of the office, bureau, division, or department concerned, when, if an agreement is not reached, the employees or their representatives may refer the matter, with all supporting papers, to the board. The board shall promptly hear and decide all cases, giving due notice to the chief official of the office, bureau, division, or department, and to the representatives of the employees concerned of the time and place set for hearing. The board shall have the power and authority to administer oaths, issue subpoenas, examine witnesses, and do such other administrative acts as are necessary to enable them to effectively perform the functions of the board, and shall enjoy complete and unrestricted access to all records of any office, bureau, division, or department of the Government service affecting the questions before it.

Sec. 5. That the board shall meet regularly, at stated times each month, and continue in session until all matters before it are disposed of.

Sec. 6. That unless otherwise mutually agreed all meetings of the board shall be held in the city of Washington; *Provided*, That the board shall have authority to empower one or more of its members to conduct hearings and report all testimony taken to the full board for its decision.

Sec. 7. That in hearings before the board in matters subject to its consideration the office, bureau, division, or department concerned shall be represented by such person or persons as may be designated by the chief official of said office, bureau, division, or department, and the employees shall be represented by such person or persons as may be designated by a majority of the employees concerned; *Provided*, That it shall be within the discretion of the board to permit representatives of minorities among the employees to present grievances to the board to give them a hearing.

Sec. 8. That all decisions of the board shall be approved by a majority vote of all members of the board and shall be final and binding upon all parties concerned.

Sec. 9. That the board shall keep a complete and accurate record of all matters submitted for its consideration and of all decisions made by it and make a report of its findings, together with such recommendations relating to remedial legislation necessary to the welfare of the employees as they may deem proper to the Congress of the United States on the first day of each regular session.

Sec. 10. That a report in each case decided, including the decision, shall be furnished the chief official of the office, bureau, division, or department concerned and the representative of the employee or employees concerned.

Sec. 11. That this act shall become effective upon the date of its approval.

#### STATEMENT OF MR. JAMES O. CONNELL.

MR. O'CONNELL. I am president of the metal trades department of the American Federation of Labor, which department represents in its membership all of the metal trades in the American Federation of Labor and the metal trades mechanics employed by the Government.

The bill under consideration, Mr. Chairman and members of the committee, is for the purpose of the creation of a board having to do with the adjustment of employment conditions in the navy yards, arsenals, and other mechanical departments of the Government. As the president of the metal trades department of the American Federation of Labor, I speak for all the international organizations, such as the machinists, boiler makers, molders, pattern makers, plumbers, pipe fitters, sheet metal workers, copersmiths, and such other trades as have members employed in the various mechanical departments of the Government.

We have had for a number of years an arrangement with the Navy Department by which conditions of employment have been adjusted by a board mutually agreed upon by the officials of the Navy Department, our organizations and our department. Prior to the war and during the war we had similar boards in connection with other industries, such as the private shipbuilding industry, the boards being created by the Government after having been mutually agreed upon between our department and the officials of the Navy Department and the Shipping Board, which handled all matters of labor in connection with ship-

building, either by the Government itself or by private contractors. The work of these boards was exceptionally successful, and at the last hearing on the wage matter in connection with the Government employees in the navy yards and naval stations, a board was created consisting of three members, two appointed by the Secretary of the Navy and one suggested by our department, these three members making up the board. That was a tripartite board and the boards have been tripartite boards all along. This legislation proposes a biparty board, and our purpose and reason for the organization of a biparty board is that we believe a more satisfactory result can be brought about through a biparty board than has been brought about through tripartite boards.

We have in mind, for instance, the board now operating under law in connection with the railroads, which, as you know, is a tripartite board of nine members, and from every indication no general satisfaction results from the decisions of that board. As a result there is constant disagreement, quarreling, threatening of strikes, and all that sort of thing. That is because the decisions are of an arbitrary character. The reason why we have gotten along fairly about, as far as possible, mutual understandings and mutual decisions, but the times are so changing and the industrial conditions are so changing that we believe a biparty board will operate more successfully, and for that reason the main essence of this whole bill is the creation of a biparty board.

The numbers referred to in the legislation do not mean anything. I think the bill speaks of 12, 6 from each side. That may be large or it may be small, but that does not enter into the principal or basic thought conveyed in the legislation. What we want to bring about is the establishment, by authority of law, of a legal board, a board that will have standing, so that we will not have to go through this same condition every year of appealing to the departments for the creation of a board to handle these matters, and our appeal to our membership to agree to go along with whatever decisions may be handed down. If our membership were a party to the creation of such a board, they would then, as a natural thing, agree to whatever decisions might result from such a board.

This question arises in the question of a biparty board: How decisions may be reached if a disagreement occurs or no other adjustment can be reached upon any subject that may be up for consideration? Our experience is that where a board sits down around a table in equal numbers, that, at a general proposition, agreements can be reached. As an evidence of this, I will give the case of the railroads. During the war boards were created along the lines of what were called divisional or zone boards, which handled the affairs of the railroads prior to the enactment of the railroad act, and these boards handled the cases in each zone. One board in this zone, which is called the southern zone, handled some 12,000 cases during the war, and only four cases were in disagreement, and these four cases were naturally, because of disagreement, dropped, and that would be the result by the creation of a biparty board to handle the affairs of the Navy Department and the arsenals, that there would be an agreement in a great great majority of the cases, and where there was no agreement reached the case would fall by default, so that there would be no real tieups or lockouts by reason of failure to reach decisions, and by the men coming together there would be a natural growth of the spirit of give and take. So that the finality of the whole proposition would be agreements in practically all the cases coming before such boards.

We have a concrete case, on the Panama Canal, of how a biparty board works successfully. During the construction period of the Panama Canal if a disagreement of any kind arose between the workmen and the management that could not be adjusted, it was necessary for the men to send a committee to Washington to secure a final adjustment. Owing to the distance and the time consumed these trips were very expensive to the workmen. Several years ago we secured through the cooperation of the Governor of the Panama Canal and the Secretary of War an arrangement whereby a biparty board was created, one man selected by the Governor of the Panama Canal and one by the workmen. These two heard all complaints and made recommendations to the Governor of the Panama Canal. As a result it has not been necessary for a committee of the workmen to come to Washington with grievances which are now adjusted by the board, each side being equally responsible for the decisions.

Mr. Alfus has prepared a more elaborate statement on the bill. I am simply presenting it from the standpoint of all the organizations interested locally.

nationally and internationally, indicating their being in favor of such legislation being enacted.

Mr. LONDON. In what respect is the present law being changed by the proposed bill?

Mr. O'CONNELL. There is no law at all.

Mr. LONDON. It is merely a matter of custom?

Mr. O'CONNELL. It is a matter of mutual agreement between the parties themselves.

Mr. ZHILMAN. Mr. O'Connell. I note that in the first section of the bill you provide that the six members representing the employees shall be chosen "in such manner as the civilian employees affected by this act may determine." Do you not think it would be better to say a majority of the civilian employees? The Navy Department or the War Department might take it into their heads to recognize some minority group of the employees.

Mr. O'CONNELL. Well, I think it might be well to provide for a majority, and there is no reason why it should not be a majority.

Mr. ZHILMAN. I was just foreseeing the danger of some arbitrary secretary recognizing some small minority group of the employees.

Mr. O'CONNELL. I think that is a good suggestion, and that is a matter of detail that can be worked out. We simply want the employees themselves to select their representatives so that it can not be said that some one has done it for them.

#### STATEMENT OF MR. N. P. ALIFAS, PRESIDENT OF DISTRICT NO. 44, INTERNATIONAL ASSOCIATION OF MACHINISTS.

Mr. ALIFAS. Mr. Chairman, our association comprises all of the machinists in the Government service who belong to the International Association of Machinists, and that includes approximately 90 per cent of all those employed, so we feel that in speaking for these employees who are directly concerned in this bill we are fairly representing the sentiment of those who will be affected by the act in the event it is enacted into law.

This bill (H. R. 11956), introduced by Mr. Hull, of Iowa, has been very carefully drawn. It is based primarily on a report that was gotten out after an exhaustive study by the Labor Bureau (Inc.), of New York. This organization is composed of economic experts, statisticians, and engineers who can be regarded as the highest authority on practical economics, industrial surveys, and these sorts of subjects.

In the first place, Mr. Chairman and gentlemen, the bill aims to recognize the principle of collective bargaining by the establishment of a biparty wage and grievance board as between the employees of the Government and the Navy and War Departments of the Government and to provide a basis for a more equitable adjustment of wages.

Mr. O'Connell, who presided here, has explained to you somewhat the reasons why we are asking for a biparty board as against a board otherwise composed. He has touched to some extent on what might happen in event the board failed to agree, in view of the fact that the board is composed of an equal number of representatives of both sides of the questions which will be before it. In addition to what he has said, I might add, as you know from your experience in Congress, that you have no difficulty in reaching agreements as to differences that exist between the two Houses of Congress. We have organized conference committees and I have laid down such rules as enable them to reach agreements. It is also well known that a great deal of the business of both Houses of Congress is transacted by unanimous consent. When a board sits down around a table and the members are regarded as equals they are more likely to try to reach an agreement than if the board were otherwise composed and where each side is appealing to the judgment of an umpire. Under these conditions each side tries to present an exaggerated case, or exaggerated facts as to its side of the case, whereas if they know they are equal they can with safety advance such arguments as are in conformity with logic, justice, and fairness, knowing that they have as much power as the other side to reach conclusions. A board composed of equal numbers for both sides, such as this, would have the power to determine beforehand just what they would do in event they failed to reach an agreement and lay down rules for breaking a deadlock.

Mr. ATKESON. What do you mean by a bipartisan board?

Mr. ALIFAS. By a biparty board we mean a board composed of an equal number of representatives from both sides of the controversy—that is, in this in-

stance, there are six representatives of the employees and six representatives of the departments.

Mr. ATKESON. But you do not mean to convey the idea of a bipartisan board in a political sense?

Mr. ALIFAS. No. This is to be a nonpolitical board. I did not mean a bipartisan political board, but a biparty industrial board. It has nothing to do with politics whatever.

Mr. ATKESON. If there were any politics in it it might not be as well balanced as you suppose.

Mr. ALIFAS. Now, gentlemen, as to the way this sort of principle has worked out in practice—Mr. O'Connell has just suggested that it be explained to this committee that in the operation of this board there are no expenses attached to it in so far as the Government is concerned, except to hire a clerk and to provide a board room and such incidentals as would be needed to handle the paper work. The representatives of the employees will have to be paid for by the employees themselves, so that it will not involve an expense such as was contemplated in the transportation act under which the railroad board was established, with good salaries attached to the positions.

Now, as to the way this principle has worked out in practice. Under the transportation act, in addition to the Railroad Labor Board, which is composed of nine members, a triparty board, there were established several adjustment boards that were biparty in structure, and in conversations we have had with the members of those boards we learned that in deciding hundreds and, I understand, thousands of cases they have invariably reached decisions. There has not been a single case on record where they have failed to agree. That is just an evidence of the fact that a biparty board is practical and that it is not constructed in such a way as to invite continuous deadlocks.

Mr. ZHILMAN. Mr. Alifas, you were not present when I asked Mr. O'Connell about the manner of determining the civilian employees' representatives on this board. Under this bill what is to prevent a minority of the members of some other organization or the members of no organization from selecting the representatives of the employees if the Secretary of the Navy and the Secretary of War should determine to recognize that minority of the employees?

Mr. ALIFAS. The act provides that these representatives shall be determined in such manner as the majority of the employees decide.

Mr. ZHILMAN. The bill does not say that.

Mr. ALIFAS. The bill provides for six members, who shall be chosen in such manner as the civilian employees affected by this act may determine. Under any sensible construction, if the employees as a whole decided by a majority vote of all those voting to select a certain six employees or other persons to represent them, that would constitute a choice; and the act, as we understand it, does not give the Secretaries of the departments the authority to determine who is elected. It is a biparty board in every sense of the word, and the departments would not have authority to determine who the six men were to be representing the employees any more than the employees would have the right to determine who the departments' six men were to be.

Mr. ZHILMAN. But if there were two groups of employees the Secretaries would be called upon to determine which group to recognize, so it seems to me it would clarify it if you would put the word "majority" in there.

Mr. ALIFAS. Perhaps that would be an improvement. We feel that the faction of the employees which is organized would be able to select such representatives as would satisfy them and the vast majority of the employees and that any minorities in the navy yards would have the right of representation in accordance with the terms of the act, which gives the board authority to hear minority groups.

Mr. LONDON. Does this bill contemplate the establishment of one board of adjustment?

Mr. ALIFAS. Yes, sir; for the two departments.

Mr. LONDON. To act for all the navy yards of the country?

Mr. ALIFAS. Yes, sir; and all the arsenals.

Mr. LONDON. This board is to be a board of appeals from the decisions of local boards of adjustment?

Mr. ALIFAS. Yes, sir.

Mr. LONDON. Local boards of adjustment exist now?

Mr. ALIFAS. In some instances; yes, sir.

Mr. LONDON. Is there no provision in the law for the maintenance of local boards of adjustment?



Mr. ALIFAS. As for the navy yards there is a provision for the establishment of local boards as far as wages are concerned, but there are no boards for the handling of grievances. However, the employees are not represented on these boards, but are merely accorded hearings. At the arsenals there are no local boards authorized in so far as the law is concerned, but the commanding officers of the arsenals are authorized to determine wages and to administer discipline. During recent years they have of their own volition organized wage boards at some of the arsenals equally composed of representatives of the management and the employees with recommending power only to the commanding officer, but there are no such boards existing for the purpose of handling grievances at all of the arsenals. These boards, however, have little discretionary power, because of the rules of procedure laid down for them by the managements.

Mr. ATKESON. In case of confusion or of conflict in the selection of these civilian six members of the board would the other six members, appointed by the Secretary of War and by the Secretary of the Navy, have the power to recognize, in case of contest, any one set of civilians as against the other set? Suppose you got into trouble in the selection of these six civilians, and one bunch of fellows certified one bunch of fellows as duly elected, and one certified another set of men. Would the six men selected by the departments have the right to determine that sort of a dispute and to recognize one set to the exclusion of the other set that might be presented?

Mr. ALIFAS. It is my judgment that the departments would be doing nothing to determine whom they should recognize; that should be done either unofficially or left to some other agency of the Government, possibly the Department of Justice, which interprets the law.

Mr. ATKESON. But if you had two sets of men clamoring for recognition how would you settle that?

Mr. ALIFAS. Well, the Department of Justice or the Department of Labor might be able to settle which should be recognized.

Mr. LONGBOW. In any event that would have to be determined in an unofficial way?

Mr. ALIFAS. Yes, sir.

Mr. FAVOR. You have a board of 12 members, six representing the departments and six the employees. Have you provided for any method of decision in case either side fails to have a majority?

Mr. ALIFAS. I have stated in my previous remarks that the experience we have had with the railroad boards of adjustment, which are evenly composed, has been that they have a 100 per cent batting average as far as reaching decisions are concerned and I think the board itself can determine how it is to break deadlocks before they try to reach decisions. The worst that could happen if they could not decide on any method of breaking a deadlock and if they could not agree on anything, would be that conditions would remain in status quo; and there are so many conditions arising that either party would have no power to bring pressure on the other party to compel them to decide something; each side would have something to give and something to take; in other words, if they could not make the other side yield on one thing they might wait until another case came up in which they had an advantage and then they could refuse to yield on that until the other faction of the board yielded on the other questions at issue. So I think each party would have the power to force the other one to yield in the long run. As I have also stated, Congress has devised conference committee rules as a means of getting the two Houses to agree on their differences, both Houses being equal, and it is very seldom that they get deadlocked on a bill so that it never emanates from conference, although that occasionally happens, but as a general rule the deadlock is broken.

Now, Mr. Chairman, if I may be permitted, I desire to pass over section 3 for a moment and refer to section 4 of the bill, which provides for the adjustment of grievances. At the present time in the navy yards and arsenals there is no adequate or proper machinery for the adjustment of grievances. As a rule, if we receive a communication from some navy yard or arsenal that a grievance exists, that an employee has been discharged unjustly in his opinion, or some other matter that constitutes a grievance, we go to the department and the department requests us to submit our complaint in writing, that letter, as a rule, is transmitted to the point at which the grievance has originated, the commandant or commanding officer there writes up a report and presents the views, as a rule, of those of the management who have been responsible

for the grievance. It is human nature for an individual to contend that he was right in the exercise of his authority, and the result almost invariably is that when the report comes back the sense of it is that they were right in the first place, and there is no reason for altering the decision. The result is that it is very, very seldom that the grievance is satisfactorily adjusted, and this results in a great deal of dissatisfaction at these plants, resulting in interfering with the morale of a plant and with the efficiency of its operation. So we feel that if this board is authorized not only to be a wage board, but also a grievance board, it will serve a very useful purpose, not only from the viewpoint of employees but from the viewpoint of the management.

The other remaining sections of the bill relate to such matters as hearings, the board is to meet, where it is to meet, right of representation at wages, and provision for recognizing the rights of minorities, what shall constitute a decision of the board, the keeping of records and recommending remedial legislation, and giving of reports and decisions to parties at interest.

Now, as to section 3, which constitutes a new basis for determining wages, I would like to say that our association has been very much interested in that subject. We have been so much interested in it that last year we employed the services of the Labor Bureau, Incorporated, of New York, for the purpose of making a survey of facts relating to the rate of production in the United States and other elements which would have a bearing on wages, analyzing the situation and preparing a report for us, which would furnish a basis for a new and equitable method of setting wages to take the place of the one that now exists. The provisions of section 3 concerning these losses are largely taken from the bases which are incorporated in the transportation act and which are used by the Railroad Labor Board in determining wages on the railroads. We eliminated some which we did not think applied and others which we thought conflicted with the new bases that we are proposing. They are, in brief, as follows:

"(a) The maintenance of a standard of living for the worker and his family which will insure health and decency."

The import of that provision is based on a report that was gotten out by the Department of Labor in August, 1919, specifying a tentative budget for a family of five in Washington, D. C. We felt that that budget should be the minimum that a man with a family of a wife and three children should be compelled to live on.

Mr. ATKESON. What is the date of it?

Mr. ALIFAS. August, 1919. To show the committee that this budget is not extravagant, I would like to read to you a few of the items of expense. For instance, on page 12 of the budget there is shown a list of articles of clothing that the husband of the family is supposed to have. He is allowed to get one straw hat every year at a cost of \$2. At that time you could not get much of a straw hat for \$2. He is allowed 12 pairs of socks per year and they are specified as cotton and not silk. There are no silk shirts in this budget. It provides for one pair of low shoes every other year and for one pair of high shoes every year. It provides for three neckties, at 50 cents apiece. Very few people were willing at that time to wear 50-cent neckties, but you can get better ones now for 50 cents. At that time such a necktie was a very cheap-looking affair. Under the head of miscellaneous expenditures it provides \$20 a year to the entire family for amusements. If you analyze that you will find that it would allow the family to go only once every five weeks to a downtown moving-picture show. If they attended a moving-picture show every five weeks the entire expense money for amusements would be gone.

Mr. ATKESON. That would depend upon the price of the show.

Mr. ALIFAS. The downtown picture shows at that time, I think, were 45, 50, and 55 cents. For incidentals there is an allowance of \$52 a year for the entire family or \$1 per week. That includes such items as tobacco, candy, and other little knickknacks of that kind for the children. Nothing is provided in this budget for Christmas expenditures except out of that fund for incidentals.

Mr. LONGBOW. Is there any allowance for education?

Mr. ALIFAS. It provides \$8.40 per year for newspapers.

Mr. LONGBOW. That will provide one paper.

Mr. ALIFAS. Yes, sir. It would not include a Sunday paper, because you can not get a Washington paper daily and Sunday for that price. It provides for the maintenance of three children, one aged 11 years, one 5 years, and one 2 years. When they get older than that this budget would not be suffi-

client and the family would be running short of supplies. It is a very conservative budget.

Mr. UPHAW. I think it is a very skippy budget. There is not much hope for the country if we do not have more than five members of the family, and there will not be much happiness under that sort of budget. I am for higher wages.

Mr. ALFAS. This bill in effect provides this budget as the minimum that employees should be required to subsist upon, and the better grades of workmen, of course, should get higher rates of pay.

Mr. ATKESON. Suppose they have no families?

Mr. ALFAS. Every man is a potential family man, and every man should have enough wages to enable him to support a family if he, perchance, should have or acquire one. It is the aim of the Department of Labor, I understand, to revise and to keep up to date this budget, so that for any given year it will be possible to determine what wage would be required to enable an employee to provide that budget.

Now, we have a report here, of which I have already spoken. I had hoped to read this report, but, in view of the fact that the House is going to adjourn shortly, instead of reading it, I thought the members of the committee would perhaps prefer to have me simply insert it in the record as a part of my remarks. It is a report that is worthy of study, and a mere explanation of it might not be adequate.

Mr. LONDON. By whom was the report prepared?

Mr. ALFAS. This report was prepared by the Labor Bureau (Inc.), of New York. This bureau has been established for the purpose of furnishing expert assistance along the lines of economic, social, and political research. The organization has associated with it and employed by it a corps of engineers, accountants, economists, and others, with practical experience in research work, all of them being men of college education. This particular report was made under the direction of Mr. George Soule, one of the economists and a director of the Labor Bureau (Inc.). The report covers about 80 pages of typewritten matter, together with appendices covering about 70 pages of typewritten matter, pages of printed matter. The study is divided into four sections, together with seven appendices. One is devoted to an explanation of different theories of wage determination; one to facts relating to volume of production both in the United States and abroad; one to the application of those facts in wage determination; and one to the probable effect of this proposed method of fixing wages.

Mr. ZHILMAN. If there is no objection on the part of the committee, the report submitted by Mr. Alfais will be inserted in the record. There being no objection, it is so ordered.

(The report referred to appears in the appendix to this hearing.)

Mr. ALFAS. For the benefit of those who are here I can explain the main drift of the report in just a few words, and, with your consent, I will do so. I have already explained that it is divided into four main sections. The five divisions reached in this report are Dr. Edmund E. Day, of Harvard University, in the United States has been published by the committee on economic research of the statistical service of Harvard University. It is here used in part as a basis for a wage theory. In order to show you that these investigations and researches of Doctor Day are not based upon snap judgment, I will here just exhibit for your visual information a printed volume containing the explanation of their scope and methods used. I do not hope to have this of closely printed matter, including charts and statistics.

Mr. LONDON. What is the title of that work?

Mr. ALFAS. The title of this work is *An Index of the Physical Volume of Production in the United States*, by Edmund E. Day.

Mr. LONDON. It is published where?

Mr. ALFAS. It is published at Cambridge, Mass., by the committee on economic research of the statistical service of Harvard University, 1921.

Mr. ATKESON. Has that matter you have in that report ever been printed?

Mr. ALFAS. No, sir.

Mr. ATKESON. It will make a considerable volume.

Mr. ALFAS. I will endeavor to explain to you just how important it really is, and I believe you will agree with me that it is well worth reading over and studying at your leisure. Another one of the five principal authorities cited is

Dr. Walter W. Stewart, of Amherst College. He has constructed *An Index of the Volume of Production*, a copy of which I have here in this little volume. It covers only 13 pages. It is succinct and brief, and I believe it would be of advantage to the committee to have it. I request that it be inserted in the record.

Mr. ZHILMAN. Is that contained in the larger report you have submitted?

Mr. ALFAS. No, sir. This is for verification of the data that has been referred to in the typewritten report. Then we have Dr. Paul H. Douglas, of the University of Chicago, who has made an exhaustive study of real wages, or the purchasing power of wages, from 1880 to 1918. He is a recognized authority on economic subjects and has been a prolific contributor to such publications devoted to economic research as the *American Economic Review*. Then we have Dr. I. M. Rubinow, who in 1914 published a treatise on *The Recent Trend of Real Wages*—that is to say, upon the purchasing power of wages, after having made an exhaustive study of the subject. He is a man of experience, learning, and influence. Who's Who in America devotes a long paragraph to describing his associations and activities. He was in his early days a doctor of medicine, but he gave that up to take up economics. Immediately upon embarking on this course of endeavor he became examiner of the United States Civil Service Commission and later on an expert in the Bureau of Statistics in the Department of Agriculture. Later on he became librarian of the Bureau of Statistics, United States Department of Commerce and Labor, and still later on an expert of the Bureau of Labor. Then he became the chief statistician of the American branch of one of the insurance companies of England. He has also been a lecturer on social insurance, was editor of *The Survey* and president of the Casualty Actuarial Society of America, as well as a member of several sociological, economic, and scientific organizations, both in this country and abroad.

Mr. LONDON. His book on social insurance is the best work ever published in this country on that subject.

Mr. ALFAS. Yes, sir. He is the author of many works on practical and economic subjects. Then we have Dr. Arthur L. Bowley, professor of statistics of the University of London, who wrote *The Change in the Distribution of the National Income from 1880 to 1913*, showing that labor got from 35 to 384 per cent of the value added to production in manufacturing industry in England. This proportion was so uniform during the term of years covered that it was believed by him that it was based on some economic law. He showed that labor got, on an average, 37½ per cent of the value of the product, and that the manufacturer got 62½ per cent of the value of the product, and that the manufacturer got 62½ per cent of the value of the product over the period from about 1890 to 1913. Chart 2 in our report shows that of the value added by manufacture in the United States from 1890 to 1914 labor got an average of 42 per cent in all industries, and that in the metal and metal products industry, which is similar to work performed at navy yards and arsenals, other than the steel industry, it got 42 per cent. The study made in this country and the study made in England shows that out of the value added by manufacturing industry there is a very nearly fixed proportion for labor and capital, which is governed by some economic law. Those studies would show at least that the respective pulling powers of labor and capital have resulted either in a balance or deadlock or a condition of status quo. We might draw from that the conclusion that capital and labor might well call a truce and devote their energy to combating some other element of society which might be accused of gouging both.

These are the five main authorities. Then, in the back of this typewritten report, we have statements from thirty or forty professors of political economy in various colleges and universities in the United States in which they answer a questionnaire, which is also included here, as to whether, or not, collective bargaining, which is proposed in this bill, by the way, is proper, and whether, or not, labor can get its just share of production unless collective bargaining is recognized.

Therefore, taking it all in all, the contents of this volume are based upon authoritative and well-founded information. Before the report was submitted to us by the Labor Bureau, Incorporated, they submitted it for review to several professors of political economy at various colleges, so that it has been well criticized and carefully prepared. We believe that it is an authoritative contribution to economic thought, and that it has a direct bearing upon the bill before the committee.

Mr. ATKESON. Is there any consideration given in that book to the question of supply and demand as it applies to labor?

Mr. ALIFAS. There has been a great deal of consideration given to that subject; yes, sir. That is discussed amply.

Mr. LONBOS. You mean the same law that controls the price of potatoes and other farm products. That is your theory?

Mr. ATKINSON. I wanted to know whether that question was discussed in the report.

Mr. ALIFAS. The studies comprised in this report show two or three very startling discoveries to have been made. One, as I have said, is that both in the United States and England it is shown that labor and capital have been getting almost a fixed proportion, with a deviation of only about 2 or 3 per cent, of the value added by manufacture, and that that has held true during 80 years approximately.

Mr. ATKINSON. You mean by that that labor got so much and capital got all the rest?

Mr. ALIFAS. I mean that labor got 37½ per cent and capital got 62½ per cent, and that that average had deviated only 2 or 3 per cent during a period of 80 years or more. These studies also disclosed that from the early sixties up to 1886, as production increased wages also increased in proportion, so that labor got some of the benefit of the increased productivity; but in 1896 something happened that has not yet been ascertained which caused the drift to go the other way. From 1896 or 1900 up to 1918, there was a gradual encroachment on the part of middlemen on both labor and capital, so that labor, during that period, not only failed to get the additional 30 per cent by which the per capita production had increased, but the purchasing power of the dollar decreased, so that the wages which the worker got in 1918 was 30 per cent lower than the wage received in 1899. Therefore, there was a shift of 60 per cent or more in purchasing power that labor ought to have retained but that it did not get, but we believe that this report will disclose a method whereby that sort of injustice can be remedied.

The bill proposes that wages shall be adjusted annually to accord with increased productivity, which averages two or three per cent per year, and that the cost of living shall affect the wages of labor, either up or down, as the case may be. It provides that this increased production factor shall be added annually, and that the increase in production is to be averaged over a period of 10 years. We have booms and business depressions which they claim cover periods of about 7 years; and, in order not to have such a wide fluctuation in the rates of pay, which would emphasize the depressions and, possibly, also emphasize the booms, it would be better to average it over 10-year periods. In that way we would get a result that would be more uniform.

Mr. Chairman and gentlemen, I had intended in the earlier part of my remarks to read into the record the wage law which applies to navy yards and which indirectly governs the wage situation at arsenals. It is very short, and, with your permission, I will read it. The act of December 21, 1861, provides:

"That the hours of labor in the navy yards of the United States shall be the same as in the private shipyards at or nearest the post where such navy yard is established, and the wages to be paid to all employees in such yards shall be, as near as may be, the average price paid to employees of the same grade in private shipyards or workshops in or nearest to the same vicinity, to be determined by the commandant of the navy yard."

The act of July 16, 1862, provides:

"That section 8 of an act to further promote the efficiency of the Navy, approved December 21, 1861, be amended so as to read as follows:

"That the hours of labor and the rates of wages of the employees in the navy yards shall conform, as nearly as is consistent with the public interest, with those of private establishments in the immediate vicinity of the respective yards, to be determined by the commandants of the navy yards subject to the approval and revision of the Secretary of the Navy."

The only alteration that has been made of this law since its enactment has been to make the hours of labor eight hours per day. All of the rest of it is in the present law unchanged.

There is no law that governs the establishment of wages at arsenals, other than the authority of the department to employ labor, but they have taken this Navy wage law as a basis upon which to promulgate regulations. In the regulations for administration of the civil service in the Ordnance Department, as revised up to 1918, the following is provided in Regulation No. 16:

"When it appears necessary, the commanding officer of any Ordnance establishment shall, by correspondence or otherwise, make diligent inquiry of the

principal private manufacturing establishments, not including employees of the United States Government in the vicinity of his post, which in his opinion should best furnish the comparison desired as to the rates of wages paid to the workmen of different grades in each trade or occupation for work of a similar nature and grade to that done at his post, or resulting if as nearly as possible. The 'vicinity' of the post is to be taken as the region lying within a boundary sufficient to insure similarity of conditions of employment and living to those at the point where the effort to fix the wages is being made."

Section 4 reads:

"If the result of the investigation by the commanding officer shows that changes are necessary to equalize the rates paid by him and those paid in the vicinity under the conditions applicable, he will submit to the Chief of Ordnance, for his action, a new schedule of wages, with reasons therefor, and at the same time will make a report showing in full what increase or decrease would be involved in the wages of any grade of any trade or occupation; and when said schedule is approved by the Chief of Ordnance it shall remain in force until further change is authorized, and shall be fully published for the information of applicants. Employees in Schedules C to H, inclusive, may be promoted or reduced by the commanding officer, provided a change of work is involved requiring a change of designation."

Mr. BURKE. That simply means they shall be paid the prevailing wages paid for the same class of service performed?

Mr. ALIFAS. Yes, sir.

Mr. BURKE. Have they carried that out?

Mr. ALIFAS. We believe they have carried it out very conservatively. This regulation has been modified by an act of Congress. Last year when the Army appropriation bill was passed, carrying appropriations for the current fiscal year, the following language was incorporated in that act:

"No part of the moneys appropriated in this act shall be used for paying to any civilian employee of the United States Government an hourly wage or salary larger than that customarily paid by private individuals for corresponding work in the same locality."

This amendment has the effect of providing as the maximum pay for employees at the arsenals the hourly wage paid in the vicinity. In other words, they can reduce wages at the arsenals as much below the prevailing rate as they can get the employees to accept, either individually or collectively.

Mr. BURKE. In other words, it fixes a maximum and not a minimum rate?

Mr. ALIFAS. Yes; it fixes a maximum and not a minimum rate. We get all the benefit of the pressure downward, but there is nothing to buoy us up under that sort of language. Furthermore, this is a restriction on the appropriation, and the disbursing officers, in order to be sure they do not spend money they have no authority to spend, which would have to be taken out of their own salaries, if it were found out, would be disposed to keep the rate well below the prevailing rate in order to be sure they are not paying too much.

Mr. BURKE. Did that bring about a reduction in wages?

Mr. ALIFAS. Yes; it has brought about many reductions, but it was passed at a time when they had just put into effect a drastic reduction in pay.

Mr. BURKE. About how much?

Mr. ALIFAS. About 21 cents an hour, and at that time we were about to protest against the reduction in pay on account of the unfavorable basis the War Department had just adopted. This law was then passed, so the injustice we felt they had imposed upon the workmen was of about equal severity to the injustice that this new law imposed on them.

Mr. BURKE. Then you were hit both ways?

Mr. ALIFAS. This is what the actual result was: The new law prevented us from securing justice as a result of an appeal.

Mr. ATKINSON. You did get the maximum under the law, did you not?

Mr. ALIFAS. No; we did not. We were about to appeal from the decisions of the local boards and the Ordnance office when this legislative rider was enacted, and the injustice imposed by this act was about equal to the injustice which the local boards and the Ordnance office had imposed on us. This did not result in further reduction at that time, but prevented us from getting justice.

While I am on that point I might explain the injustices of the decisions I referred to. They were these: For a number of years the employees at the arsenals had been paid for eight hours as much as they received in the average shop in the vicinity for whatever length of day they happened to work—8, 9,

or to hours. In some localities the shops work nine hours per day for five days in the week and five hours on Saturday. The department had ruled that under such conditions the wages of the workmen in those shops should be divided by five and five-tenths, or in shops where they worked eight hours a day for five days of the week and four hours on Saturday the weekly earnings should be divided by five and one-half in order to determine what the per diem rate should be at the arsenal, and we thought that was fair.

But before this legislative rider was passed they changed the rule and decided that they would divide the weekly earnings by six, so an employee at the arsenal had to work a full six days to earn as much money as he would in a private shop in five and a half days. That was one decision from which we were going to appeal.

One other was that they had refused to consider the pay at railroad shops in making a comparison with the arsenal rates. The railroad-shop men were at that time receiving the highest average rate obtaining in any large industry at that time, namely, 77 cents per hour. The result of the adjustment that was comparable, namely, 77 cents per hour, as we believe, because they have a higher grade of work at the arsenals, were getting an average of around 66 cents an hour, or 11 cents an hour below the average rate paid in railroad shops.

Another fault we had to find with this language was that it enables the Ordnance Bureau of the War Department to substitute the hourly rate for the daily rate. The passage of the 8-hour law contemplated that if a workman worked eight hours a day he should get as much pay as if he worked any other number of hours per day. This new law changed matters so that arsenal employees working eight hours would get only eight-ninths of the pay received by employees of private concerns working nine hours. That we felt was an injustice.

Happily this has been modified in this year's War Department appropriation bill, although only slightly. They have struck out the word "hourly" and substituted the words "average daily," but the average daily wage still remains the maximum that can be paid and leaves nothing to protect the employees from a revision downward, as far as the Ordnance Office may desire to force wages under the law.

Mr. ATKESON. Was not the maximum fixed as a restriction on the department to keep them from paying too much?

Mr. ALFAS. Yes, sir; it was.

Mr. ATKESON. It was not aimed at the employees?

Mr. ALFAS. It affects the employees.

Mr. ATKESON. I know; but it was aimed at the other fellow.

Mr. ALFAS. It was aimed at the department. Congress was apparently under the impression that the department was willing to pay as much as they had permission to pay. But our experience with the department has been that they generally look upon wage questions from the viewpoint of the employer, and they need no encouragement to induce them to get the wage scale as low as they can get the workers to accept.

Mr. ATKESON. Is the rule, is it not, that where a maximum rate is fixed that is generally the amount they would get?

Mr. ALFAS. Yes, sir.

Mr. ATKESON. That is, as a general proposition?

Mr. ALFAS. It is supposed to be that way, but the Government service provides certain privileges that do not exist in certain private plants, such as leave of absence with pay, and things of that sort. When an employee is confronted with the proposition of quitting his employment at the arsenal, seeking private employment and accepting the prevailing wage which goes with it, as a means of inducing the arsenal authorities to pay him the prevailing rate, he is tempted to figure how much less wages he is willing to accept, in lieu of these privileges, in order to retain employment at the arsenal, so these so-called gratuities are taken into consideration when the law of supply and demand alone is in operation in wage determinations.

We believe the United States Government should get away from that idea of paying the prevailing wage for this reason: The prevailing rate is often times—in fact more times—based on the law of supply and demand. It is very seldom that the prevailing rate is set in accordance with the principles of collective bargaining. If the result is an unjust wage, then the United States Government in following the prevailing wage is obliged to enmesh injustice. Instead of that, it ought to have an independent way of determining these things, based on fairness and justice.

Mr. Chairman, there is much more to be said, but the time for adjournment is near and this report, with the appendices, I believe will amply justify your committee in taking favorable action on the bill. I request permission of the committee to insert those appendices in the record. They are very short; one consists of 7 typewritten pages and another of 13 printed pages.

Mr. BURKE. If there is no objection, you will have the privilege of putting in the record anything you may desire. Are there any objections?

Mr. ATKESON. I have no objection, unless by so doing we might work at cross-purposes with the Committee on Printing. That is the only thought I had in mind.

Mr. BURKE. If there is no objection, it will be so ordered.

Mr. ALFAS. Thank you, Mr. Chairman and gentlemen of the committee, for your very courteous attention and for the privilege of being able to present this matter to you to-day.

(Thereupon the committee adjourned.)

## APPENDIX.

### REPORT ON THE RELATION BETWEEN WAGES AND PRODUCTION.

[Prepared for District Council No. 44, International Association of Machinists July, 1921, by the Labor Bureau (Inc.), New York City; George Soule, director in charge.]

#### ACKNOWLEDGMENTS.

Thanks are due especially to Prof. William F. Ogburn, of Columbia University, for advice and criticism, and also to Prof. John Bates Clark and Prof. Henry B. Seager, of Columbia University, to Dr. Wesley C. Mitchell and Dr. Leo Wolman, of the New School for Social Research, and to Mr. Oswald Knauth, of the National Bureau of Economic Research.

We are much indebted to Dr. Paul Douglas, of the University of Chicago, for permission to use his study of real wages in Appendix G.

We must also gratefully acknowledge the courtesy of the distinguished economists who answered the questionnaire in Appendix B, as well as that of Prof. Edmund E. Day, of Harvard University, and Prof. Walter W. Stewart, of Amherst College, who clarified for us certain questions in regard to their indices of production.

#### INTRODUCTION.

The wages of machinists in Federal employ can not be determined by the methods now possible in determining wages of those in private employ. For the latter may withdraw their labor collectively, and thus use their economic power in collective bargaining to gain increases. Economists are almost unanimous in the opinion that labor may, by collective bargaining, appreciably enlarge its recompense, and that, in fact, without collective bargaining labor is not likely to receive a fair share of the national income. (See Appendices A and B.) But since Federal employees should not be obliged to strike, their wages should not depend on any balance of economic power between them and the Government, and some more scientific principle of wage determination must be applied.

In the past wages in the arsenals and navy yards have been determined by the current rates in neighboring plants. During the war, wages were adjusted in some relation to the rise in the cost of living. The latter practice has now been abandoned by mutual consent.

Neither of these methods is satisfactory, and neither is based on a sound theory. To make the wages of Government employees depend wholly on the current market rates involves a large chance of injustice. These rates themselves are not the result of any scientific calculation. They may be the result of collective bargaining, or on the other hand they may be only the rates which wage earners are able to obtain as the result of competition in an open labor market, dealing individually with the superior economic power of combinations of capital. They are not fixed according to any standards such as binations of capital. If the Government, as an employer with a duty to the general welfare, ought to establish, in such a matter the Government ought to be a leader rather than a follower. It ought not to adopt the arbitrary method of paying whatever private employers might chance to pay.

To lower or raise wage rates in the same ratio as the fall or rise in the cost of living is also arbitrary and unsatisfactory. It assumes that the wage at which the process starts is a just and proper wage, and it alters it only as the retail price level changes. It thus perpetuates the wageworker's existing standard of living, although almost all authorities agree that the standard of living of all classes should rise with the rise in the general standards and wealth of the community. (See appendix B.)

It is obvious that, for the good of all concerned, the movement of wages should bear some relation to the national wealth. Specifically, it should bear some relation to the product of industry. We do not mean by this that stop-watch and time methods should be adopted which set one worker in competition against another, but may not raise the average level of real wages in the least. We mean that the wage-earners as a whole, or any considerable group of wage-earners, should receive a larger reward as the product of their labor increases. This larger reward may be expressed in terms of uniform wage rates covering every one in a certain occupation, as before. We are not seeking a principle which shall introduce a method of varying the wage rates among individual workers, but one which shall set a standard for the average or normal wage.

The following study is an attempt to arrive at such a principle. A brief summary of the wage theories held by economists establishes the broad theoretical basis of the inquiry. A study of the facts of production, and of the wage-earners' share in the product of industry, leads to the formulation of a general principle and suggested method of applying it. A study covering such a broad field is necessarily capable of much expansion, but we believe that as far as we have been able to go we are on solid ground, and that the principle developed is at least more scientific than the method now used in fixing the wages of machinists in Federal employ.

That principle is, briefly stated, that average real wages should increase at least in direct ratio to the increase in per capita production.

#### A. THEORIES OF WAGES HELD BY ECONOMISTS.

##### 1. SUBSISTENCE THEORY OR "IRON LAW."

The subsistence theory of wages was one of the first developed by early economists, and has been now abandoned by virtually all authorities. It held that wages would always be depressed to the lowest level at which the working population could be kept alive. Wages could not remain lower than this for if they did so the death rate would increase, thus diminishing the supply of laborers and enabling them to demand higher pay. On the other hand, if wages should go above the subsistence level, birth rate would increase and the death rate would decrease, so that there would be an over-supply of laborers and wages would go down again. The truth of this theory depended on a number of assumptions which are not well founded. It is not true, for instance, that the birth rate increases with higher wages, but rather the contrary. The theory also does not take any account of increasing productivity due to technical progress, which may enlarge the total product faster than the growth of population. Many other complications are ignored by it altogether.

##### II. STANDARD OF LIVING THEORY.

This theory was developed somewhat later as a modification of the subsistence theory. It held that the wage level is set by the standard of living of the worker, whatever it might be. His standard of living might be close to the subsistence level, or on the other hand it might be much higher. But since the wage-earner, through habit and social custom, expects a certain standard, he will except under extraordinary circumstances, refuse to work for less. He will not marry and rear children unless he can bring them up in what he believes to be a decent way. There is thus a tendency to limit the supply of labor when wages become too low to maintain the standard of living.

It is this theory has some truth in it, but it leaves many things unexplained. Why do standards of living vary? Standards may go up or down in the course of time; what brings about this result? In other words, we are back to the fundamental question: What determines wages?

#### III. WAGE FUND THEORY.

The wage fund theory was an attempt to answer this fundamental question. It is not held by modern authorities, having been thoroughly discredited within the last 50 years. According to this theory, all physical goods, whether for consumption or for use in production, are called "capital." There is at any time a given amount of capital in the world, and out of this capital wages are paid. The amount of wages depends on the amount of capital; the larger the capital, the larger the wages. If there were no capital there would be no wages. The capitalist, therefore, provides work for the wage-earner and the wage-earner always gets exactly what he deserves. If he gets more than a certain amount, he will encroach on capital; capital will shrink, and wages will fall. If he gets less than this amount, capital will grow, and in order to find use must compete for labor and pay higher wages.

There is a certain obvious truth in this theory, but beyond that it is misleading. It is true, of course, that workmen can not consume more physical goods than there are in the world. It is also true that if the capital devoted to production shrinks, there will be fewer physical goods to consume. Here the truth in the theory stops. It is misleading to lump consumption goods together with the instruments of production under the term "capital." One kind of goods can not easily be converted into the other. It is misleading to identify either of these kinds of goods with private property in them, expressed in terms of money. The "capitalist" is no more responsible for the existence of physical goods than the laborer. Furthermore, it is absolutely untrue to conclude that wages can not rise beyond a certain point without decreasing the capital devoted to production. Rising wages, by creating demand for products, may encourage their production, and thus lead to the increase of productive capital. The "wage fund" is not a fixed quantity, for although it may be limited at any given moment, it is capable of being indefinitely enlarged over a period of time. How much it can be expanded depends not so much on the rate of wages as on other factors such as natural resources and technical efficiency.

#### IV. PRODUCTION THEORY.

Many present-day authorities have substituted for the old theories the production theory of wages. Ignoring variations of detail, the theory may be stated as follows:

The total amount of goods available for distribution among the population is, of course, the total amount produced for consumption purposes. The more goods there are produced, the more there are to be consumed. This amount may be increased, and has been increased in modern times faster than the population increases.

There are, in general, three factors in production: Land (meaning natural resources of all sorts), capital (meaning the instruments of production), and labor (meaning work of all kinds by all classes of the population). Production results from the joint use of all three. The farmer tills his field and raises grain; the grain results from the application of labor by means of a plow (capital) to the land. If the farmer acquires more land, or the land becomes more fertile, that increases the production of grain. If the farmer uses more plows, or better plows, that increases the production of grain. If the farmer works better, that increases the production of grain. The contrary holds true in all these cases. Some factors may increase in amount or efficiency while others are decreasing. Whatever the cause of the increase or decrease in production, the farmer necessarily feels the result.

In the case of the farmer who owns his land and his tools, and raises products merely to support himself and his family, there is no problem of distribution. But where, as in modern society, some people receive income for owning land or natural resources, some for owning capital goods, and others merely for their labor, the distribution of the total product has to be accounted for. This the production economists explain by the interrelation of the various factors in production. If the amounts of labor and capital grow more rapidly than land under cultivation or other use, land becomes more in demand, and hence its owner can exact a higher rent—that is, a larger proportion of the total product. Or if a given amount of land becomes more productive in comparison with a given amount of capital or labor, it becomes more in demand and its owner can exact a higher rent. The contrary is true in each case. The same principles apply in the case of the reward of the other factors in production.

The reward which goes to the owner of a business as owner is the reward of capital and comes under the head of interest. But the reward which comes to the business man as a result of his efforts in organizing production, though it may in some cases be called profits, is considered as the reward of labor and is technically classed with wages. The business man who receives this reward is commonly called by economists the entrepreneur as distinguished from the capitalist or owner of capital.

Many production economists believe that the same principles which govern the distribution of the national income among land, labor, and capital, also govern the distribution of labor's share among the various classes of workers—that is, that a scarcity of any class of labor will increase its share, and also that the entrepreneur, the skilled workman, the common laborer, etc., will each receive wages proportionate to their relative contributions to production.

The theory, as it touches wages, may be stated as follows:

1. That wages may increase as the total product per capita increases.
2. That the proportion of the product which labor receives becomes larger (a) as the available supply of capital or of land increases in relation to the supply of labor; and (b) as the productivity of labor increases in relation to the productivity of land or capital. (This is called by economists the theory of marginal productivity.)

The contraries are true in both cases.

Some economists have gone so far as to say that this system of distribution is ethically or morally right; most of them merely maintain that it is what tends to happen under a capitalist form of economic organization.

Virtually all production economists qualify this theory by saying that it indicates what would happen under perfectly free competition. In so far as competition between capitalists or landowners has been restricted by any form of combination or monopoly, they can arbitrarily increase their share of the product. Wage earners can, in such circumstances, gain their competitive share only by opposing combinations of capital with the economic power of combinations of laborers. This is the theoretical justification for the use of strike and of collective bargaining. (Collective bargaining, of course, loses its force if it does not rest upon the potential power of the ability to strike.)

Many modern economists have come to see that the part of the productivity theory, which has to do with distribution, is modified by so many complex social and economic forces that it can not be applied in any automatic way. Some have criticized it by saying that it does not prove that every element in production receives the share of actual physical goods or services which that element produces, but rather that it receives its share of the economic value of such goods or services under our present form of industrial organizations, which is a different thing.

Economists would agree, however, that if labor does receive a constant or nearly constant proportion of the national product, real wages will increase or the average as the total per capita product of the nation increases. This is obvious and axiomatic.

(For quotations from modern economists on the production theory and collective bargaining, see Appendix A. For answers to a recent questionnaire on the same subject, see Appendix B.)

## B. STUDY OF THE FACTS OF PRODUCTION.

### 1. QUESTIONS TO BE ANSWERED.

As a preliminary to any attempt to base the determination of wages on production we must investigate the actual facts by means of statistics. Does the production of the Nation show a tendency to increase over a considerable period? Is this increase taking place at a more rapid rate than the increase in population? What are the characteristics of the increase? What share of the national income actually is paid in wages? Does this share vary widely, or does it tend to remain constant?

### II. THE COURSE OF PHYSICAL PRODUCTION AND TOTAL VOLUME OF PRODUCTION.

On the basis of general considerations, we should expect to find that a large increase in production had taken place in the United States and is still going on. Farming land and natural resources have shown no signs of becoming exhausted, but have come more into use as the population has grown. There

has been an enormous accumulation of capital goods in the instruments of production. Technical progress in machinery has greatly increased the productivity of the individual laborer. Production has constantly been organized on a larger and more efficient scale.

Various statistical studies of production have borne out the general assumption. Prof. Edwin W. Kemmerer of Princeton and Prof. Irving Fisher of Yale began the work some years ago, and recently indices of physical production have been worked out independently by Doctor King, Dr. Walter W. Stewart of Amherst, and Dr. Edmund E. Day of Harvard University. Working by somewhat different methods, all these authorities arrived at a similar result, as Dr. Carl Snyder shows in the American Economic Review for March, 1921. We quote from his comment:

"In general all of these (King, Stewart, and Day) agreed in a slope, in the last 30 years, of around 34 to 4 per cent. Considering the amount of material available, its nature, and the considerable probability of error involved, it may now be said with confidence that this is approximately the annual growth within the last generation. \* \* \* The fact which stands out, of course, in all these investigations, is the amazingly even character of this production growth, and how very slight is the variation in the flow of goods from year to year throughout periods of wide prosperity or deep depression; how slightly it was affected by the war, and how little relationship it often bore to the prevailing spirit or traditional idea of any time."

TABLE I.—Indices of physical production in the United States—Total production and production per capita.

| Year. | Physical production. |       | Population of United States. | Production per capita of population. |      |
|-------|----------------------|-------|------------------------------|--------------------------------------|------|
|       | Stewart.             | Day.  |                              | Stewart.                             | Day. |
| 1899  | 65                   | 64.6  | 77.1                         | 84                                   | 84   |
| 1900  | 66                   | 65.6  | 78.5                         | 84                                   | 84   |
| 1901  | 67                   | 66.9  | 80.1                         | 84                                   | 84   |
| 1902  | 77                   | 77.3  | 81.8                         | 94                                   | 94   |
| 1903  | 77                   | 76.4  | 83.5                         | 90                                   | 92   |
| 1904  | 75                   | 78.5  | 85.1                         | 94                                   | 92   |
| 1905  | 80                   | 87.3  | 86.8                         | 99                                   | 101  |
| 1906  | 91                   | 86.3  | 88.4                         | 101                                  | 106  |
| 1907  | 89                   | 90.9  | 90.0                         | 99                                   | 101  |
| 1908  | 84                   | 85.3  | 91.7                         | 92                                   | 91   |
| 1909  | 94                   | 88.0  | 95.4                         | 101                                  | 102  |
| 1910  | 96                   | 97.8  | 95.0                         | 101                                  | 103  |
| 1911  | 96                   | 95.6  | 96.7                         | 96                                   | 96   |
| 1912  | 101                  | 107.6 | 98.3                         | 108                                  | 106  |
| 1913  | 101                  | 105.2 | 100.0                        | 101                                  | 105  |
| 1914  | 101                  | 102.9 | 101.2                        | 109                                  | 102  |
| 1915  | 112                  | 110.8 | 102.4                        | 109                                  | 108  |
| 1916  | 117                  | 117.2 | 103.6                        | 113                                  | 111  |
| 1917  | 124                  | 119.8 | 104.8                        | 118                                  | 114  |
| 1918  | 127                  | 119.0 | 106.0                        | 118                                  | 112  |
| 1919  | 129                  | 112.5 | 107.2                        | 112                                  | 105  |
| 1920  | 129                  | 117.0 | 108.8                        | 118                                  | 108  |

<sup>1</sup> From "An index number of production," by Prof. Walter W. Stewart, of Amherst College, American Economic Review, March, 1921. Base, 1911=100.

<sup>2</sup> From "An index of physical production," by Edmund E. Day, published by the Harvard University Committee on Economic Research. Base, 1909=100.

<sup>3</sup> Index from census figures, corrected for retarded growth 1914-1918. Base, 1913=100.

<sup>4</sup> Index of production divided by index of population.

<sup>5</sup> Estimated.

For the purpose of this study we have confined ourselves to the indices of Doctor Stewart and Doctor Day which are the most recent and the most thorough. Doctor Stewart's index is built up from production figures divided into three main groups—materials, manufacture, and transportation. It is based on 32 series in all. Doctor Day's index is built up from three groups—agriculture, mining, and manufacture. It differs from Doctor Stewart's mainly in that it does not include any index of transportation, which, strictly speaking, comes under the head of services rather than the production of goods. (For complete description of these two indices and the methods of their compilation see Appendixes C and D.)

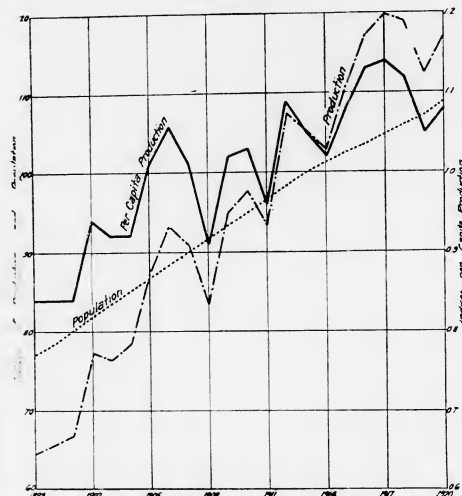


Table I shows both the Stewart and the Day indices in parallel columns, compared with the index of population. Indices of production per capita are derived by dividing the production indices by the index of population. It will be seen that production of physical goods has grown faster than the population, and hence that per capita production has markedly increased during the last 30 years.

Chart No. 1.

INDICES OF PRODUCTION, POPULATION, AND PER CAPITA PRODUCTION, 1899-1929.

Data from Table I.



III. NATURE OF THE INCREASE IN PRODUCTION.

An analysis of both indices shows that the increase has not been uniform but has varied slightly with the business cycle. Thus a falling off appears in 1903, in 1907-8, in 1911, and in 1913-14.

Analysis of the detailed indices in the exhibits also shows that agricultural materials and products have advanced least rapidly—just about keeping pace with the population; that manufactures have shown a larger increase, and that mining has shown the most rapid increase of all. Table II shows the increase in manufactured products, according to Day, compared with the increase in persons engaged in manufacture, according to the census of manufactures in 1899, 1904, 1909, and 1914. This in turn is compared with general increase in per capita production for the steel industry.

If we take production groups separately, as shown by Day, we find that while most of them have shown an increase, certain others, such as lumber, spirits, and liquors, flax seed, and passenger cars, have recently shown a falling curve. Whether this decrease has been accomplished by a corresponding decrease in the number employed in these groups it is impossible to say, owing to lack of sufficiently comprehensive population figures. It is safe to

assume, however, that extremely few groups would show a decreasing production per person engaged over any considerable period of time.

We can therefore conclude that since the per capita product shows a steady trend upward, wages on the average may show a corresponding upward trend. The next question to be investigated is the share of the total product received by labor.

TABLE II.—Index of production per wage earner in all manufacturing industries and in iron and steel and their products. United States (base, 1909=100).

## ALL MANUFACTURING INDUSTRIES.

| Year.     | Wage earners. <sup>1</sup> | Index of wage earners. | Index of physical production (Day). <sup>2</sup> | Index of production per wage earner. <sup>3</sup> |
|-----------|----------------------------|------------------------|--------------------------------------------------|---------------------------------------------------|
| 1899..... | 4,713,000                  | 71                     | 61.2                                             | 86                                                |
| 1904..... | 5,468,000                  | 81                     | 75.4                                             | 91                                                |
| 1909..... | 6,615,000                  | 100                    | 100.0                                            | 100                                               |
| 1914..... | 7,036,000                  | 106                    | 106.2                                            | 100                                               |

## IRON AND STEEL AND THEIR PRODUCTS.

| Year.     | Wage earners. <sup>1</sup> | Index of wage earners. | Index of physical production (Day). <sup>2</sup> | Index of production per wage earner. <sup>3</sup> |
|-----------|----------------------------|------------------------|--------------------------------------------------|---------------------------------------------------|
| 1899..... | 745,000                    | 72                     | 56.4                                             | 78                                                |
| 1904..... | 869,000                    | 85                     | 67.5                                             | 79                                                |
| 1909..... | 1,027,000                  | 100                    | 100.0                                            | 100                                               |
| 1914..... | 1,051,000                  | 103                    | 94.5                                             | 92                                                |

<sup>1</sup> Average number of wage earners for the year in question as given by the census of manufactures.

<sup>2</sup> Day's index of manufacturing industries and of iron and steel, converted to 1909 base.

<sup>3</sup> The drop in 1914 is of course due to the temporary depression peculiar to that year.

## IV. SHARE OF LABOR IN THE PRODUCT.

As we have seen in section A-IV, economists have devised intricate theories to account for the share of the product which labor receives. It is not necessary to accept these theories in detail, however, in order to see that if labor does receive a nearly constant share of the product, the wages should increase with an increase in per capita production.

It does not seem likely, from general consideration, that the share of labor in the income would change rapidly. Minor fluctuations, due to the business cycle, may occur, but the relative amounts of natural resources, capital, and labor in use, and the relative productivity of the various factors, have not changed rapidly enough to make an appreciable difference over periods of 15 and 20 years. This conclusion is borne out by an examination of what facts we have.

Dr. Arthur L. Bowley, professor of statistics of the University of London, in "The change in the distribution of the national income, 1880-1913," makes a statistical study of income distribution in England and concludes (p. 25):

"The proportions of (the national income) to property and labor (in 1880) are 37½ per cent and 62½ per cent, exactly as in 1913. \* \* \* So far as estimates can be made for the intermediate period, it appears that the proportion of property fell from 38½ per cent in 1880 to 36 or 35 per cent in the following 15 or 20 years, and increased since 1900 and since 1910 till it again reached 37½ per cent in 1913. (See the Economic Journal, 1904, p. 459, for estimates which indicate that the proportion was nearly the same back to 1860.)"

Note.—"Property" income as here used means income resulting from ownership, and "labor" income resulting from services, whether by wage earner, salary earner, or firm.

Page 26: "The national dividend increased more rapidly than the population in the generation before the war, so that average incomes were quite one-third greater in 1913 than in 1880; the increase was gained principally before 1900, inasmuch as when it barely kept pace with the diminishing value of money. The increase was shared with remarkable equality among the various economic classes. Property obtained a diminishing share of the home product, but an unchanged share of the whole income when income from abroad is included."

Doctor Bowley's estimate, of course, includes under the return to "labor" much besides the income of wage earners as ordinarily understood. In order

to secure an estimate for the United States, we have narrowed the scope of the inquiry to the proportion of the product of manufacturing industry received by the wage earners as distinct from salaried and management.

The census of manufactures shows the total amount paid to wage earners in the various census years, both in manufacturing industries as a whole and in 14 large industrial groups. It also shows the total of "value added by manufacture." This figure is obtained by deducting the cost of materials from the sales at the factory. It therefore represents the entire margin out of which are paid rent, interest, salaries, and wages and any corporate savings, etc. It is a better figure for the value product of industry than the "value of the product," because the latter is based on the total factory sales and includes the cost of materials, and since the product of one factory serves as the material of another, it involves much duplication. By obtaining the percentage which wages form of the "value added by manufacture," we can therefore determine what share of the value product goes to manual labor.

TABLE III.—Percentage of "value added by manufacture" paid in wages in the United States for all manufacturing industries and 14 main industrial groups (from United States Census figures).

| Group.                                                   | 1899 | 1904 | 1909 | 1914 |
|----------------------------------------------------------|------|------|------|------|
| All industries.....                                      | 42   | 42   | 40   | 41   |
| Food and kindred products.....                           | 39   | 31   | 28   | 28   |
| Textiles and their products.....                         | 47   | 47   | 45   | 47   |
| Iron and steel and their products.....                   | 47   | 48   | 47   | 49   |
| Lumber and its manufactures.....                         | 48   | 48   | 49   | 53   |
| Paper and its finished products.....                     | 55   | 50   | 48   | 48   |
| Printing.....                                            | 36   | 34   | 33   | 34   |
| Liquors and beverages.....                               | 11   | 12   | 11   | 13   |
| Chemicals and allied products.....                       | 29   | 23   | 22   | 25   |
| Stone, clay, and glass products.....                     | 56   | 55   | 54   | 55   |
| Metal and metal products, other than iron and steel..... | 39   | 42   | 42   | 42   |
| Non-metallic mineral products.....                       | 28   | 31   | 29   | 28   |
| Vehicles for land transportation.....                    | 51   | 51   | 47   | 44   |
| Railroad repair shops.....                               | 88   | 89   | 88   | 87   |
| Miscellaneous industries.....                            | 44   | 41   | 39   | 40   |

1. Since most repair shops are owned by railroads, and their product is therefore not sold, this figure merely expresses the relation between wages and total operating cost, including overhead and wages.

Table III proves that this percentage has shown a striking uniformity during the 15-year period covered by the censuses, both for industries as a whole and for each industrial group taken separately. It varies widely from industrial group to industrial group, but in each group it remains nearly constant. The only marked exception is in the group "Vehicles for land transportation," where the share of labor fell appreciably after 1904. This can undoubtedly be explained by the change in the character of the industry caused by the rapid growth of automobile manufacture, which involved more machine processes and larger investments in plant. Since, then, labor received a fairly constant share of the value product, and since production has increased, it is reasonable to conclude that the aggregate of wages has increased in nearly exact proportion to the increase in production.

It may be objected that this may not imply an increase of wages to the individual worker, since the number of wage earners may have increased in proportion to the aggregate wage payment and the total production. The answer to this objection is our previous demonstration that production has increased per capita, and the number of wage earners has consequently not increased in proportion to production.

It may be objected, again, that while the wage earners may have received a constant share of the value produced, this does not necessarily mean that they have received a constant share of the physical goods, which are not the same as the value. To this, we can tentatively answer that the wages, as well as the product, are here reckoned in terms of value, and hence the two are commensurable.

Chart No. 2.

PERCENTAGE OF VALUE ADDED BY MANUFACTURE PAID IN WAGES.  
Data from Table III.

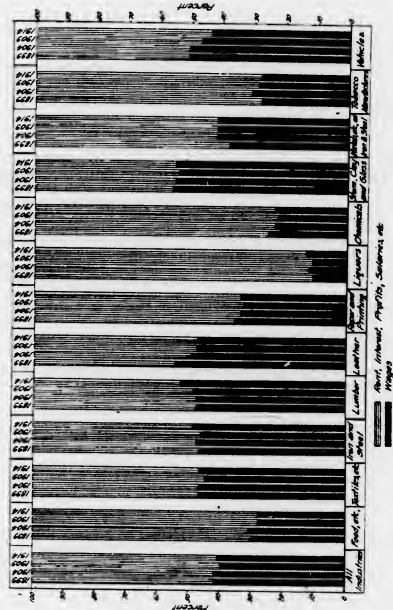


TABLE IV.—Relation between physical product, value product, and wages in rolled, forged, and other classified iron and steel products (United States Census figures).

|                                                                     | 1899          | 1904          | 1909          | 1914          |
|---------------------------------------------------------------------|---------------|---------------|---------------|---------------|
| 1. Tonnage (long tons).....                                         | 15,056,000    | 18,218,000    | 26,723,000    | 23,523,000    |
| 2. Value added by manufacture.....                                  | \$206,316,000 | \$232,761,000 | \$328,222,000 | \$327,539,000 |
| 3. Wage earners (average number).....                               | 183,000       | 208,000       | 240,000       | 249,000       |
| 4. Total wages.....                                                 | \$102,336,000 | \$122,492,000 | \$163,201,000 | \$188,142,000 |
| 5. Yearly per capita wages.....                                     | \$559         | \$589         | \$680         | \$756         |
| 6. Output per wage earner (long tons).....                          | 56.7          | 61.5          | 80.3          | 74.3          |
| 7. Value added by manufacture per dollar of wages paid (cents)..... | 2.9           | 1.9           | 2.0           | 1.7           |
| 8. Value, product per average yearly wage.....                      | \$17          | \$20          | \$48          | \$44          |
| 9. Percentage of value added by manufacture; paid in wages.....     | 50            | 52            | 50            | 57            |

1. "Value added by manufacture" divided by yearly per capita wages.



In order to check up the increase in per capita physical production with the increase in value added and the increase in wages we have taken from the census the figures of rolled, forged, and other classified iron and steel products, where it is possible to derive the per capita physical output not from an index of production but from the actual total output. This industry also has an advantage for our purpose in that it is closely allied with the industries in which machinists employed by the Federal Government work. Table IV shows that there is a close relation between actual physical output per capita (line 4) and per capita output in terms of value (line 8). The drop under 1914 in lines 1, 2, 6, 7, and 8, and the rise in line 9, merely reflect the abnormally low production due to the business depression of that year.

#### C. APPLICATION OF PRODUCTIVITY INCREASE TO WAGE DETERMINATION.

##### I. WHAT WE HAVE PROVIDED.

Our investigation of the facts of production has not proved that the workers have received what the production theorists would call their "full competitive share" of the product. Since in many great industries, such as basic iron and steel, textiles, oil refining, etc., the organization of labor has by no means kept pace with the organization of capital and of employers, and hence collective wage bargaining has not been practiced, we are justified in assuming that a large proportion of the workers in the past have probably not received their "full competitive share," and that their competition has had a depressing effect also upon the wages of organized labor. Economists are almost unanimous in the opinion that collective bargaining is necessary in order that wage earners shall receive their full share of the product. (See Appendixes A and B.) Furthermore, we have not accepted the productivity theory of distribution itself as necessarily sound. Even if the workers had received their "full competitive share," it may be that they could have received a still larger share with no harm to production, to the general welfare, or to themselves.

What has been proved is this:

1. That production per capita has shown a steadily increasing trend.
2. That manufacturing wage earners have received a nearly constant proportion of the value-product of industry.
3. That average manufacturing wages, therefore, have risen in direct ratio to the increase in per capita manufacturing production.
4. And, inferentially, that this increase has occurred without any prejudice to the accumulation of capital or the increase in productivity.

These conclusions point to a minimum limit for average wages. The general principle to be derived from them is that: Average real wages should increase at least in direct ratio to the increase in per capita production.

##### II. SOCIAL JUSTIFICATION OF THE ABOVE PRINCIPLE.

With increase in the rate of per capita production goes the possibility of improvement in standards of living for the population. If industrial wage earners do not share in that improvement, it means that other classes of the population receive a larger proportionate share. But wage earners, according to the 1914 census of manufactures, form 85 per cent of those employed in manufacturing industry, who in turn compose, on the basis of the 1910 census, 27.9 per cent of the total gainfully employed population. (The only larger class, of course, are those engaged in agriculture, who are not directly involved in this discussion.) If with the general improvement in standard of living 23 per cent of the population fail to receive their just share of that improvement, a constantly increasing difference in standards is set up between that large class of the population who receive the lowest income and consequently need improved standards most and other classes receiving higher incomes. Such a tendency can not help being harmful in a society with democratic aims and ideals, and could hardly be approved by anyone. Least of all could it be approved by representatives of the Government who are charged with fixing wages of Government employees. A tendency of this sort would affect production itself, encouraging the production of nonessentials at the expense of food, clothing, and shelter for the majority of the population. This would mean increasing social waste in the utilization of our natural resources, and eventually a restriction of total production. Furthermore, if workers knew that by increased efforts on their part they could be sure of increasing their standard of living, the productive morale of the rank and file would be improved enormously, but as long as they have no such guarantee, but feel that any increased effort on their part may lead

merely to the enrichment of other classes of the population, their natural incentive to produce is balked.

Among the principles dealing with wages adopted in 1919 by the United States Chamber of Commerce is the following: "The wage of labor must come out of the product of industry and must be earned and measured by its contribution thereto."

We also call attention to the opinion of the most prominent American economists as expressed in Appendix B.

##### 111. METHOD OF APPLYING PRODUCTIVITY INCREASE TO WAGE DETERMINATION.

1. *The basis of production measurement.*—It is one thing to say that average wages should increase at least in direct ratio to the total increase in per capita production, another to apply this principle to wages in any specific case. Wages bear a relation not only to the general increase in productivity, but also to the productivity in the industrial groups, and even to the productivity in the more limited trade or subindustry. On the one hand, it may be argued that the ability of any plant to pay wages depends on its own production rather than on the production of some other plant or of some other industry. In so far as this is true, it would tend in any special case to limit the consideration of productivity to the smaller units.

Over and against this contention, however, must be set others equally important. Plants within a competitive industrial group tend to pay the same minimum rates of wages. This is because of competition among the employers on the one hand and among the workers on the other. No matter what the relative efficiency of the plants in question, competition among employers for workers or among the workers for jobs tends to maintain a uniform minimum level throughout a given industry. This is acknowledged in most collective wage adjustments, as is seen in coal mining, railroads, and many other instances. Even where collective bargaining does not exist, as in the steel industry, movements of wage rates tend to be uniform. In cases where, as in clothing manufacture, printing, and the building trades, wage rates differ among localities on account of differing living or overhead costs, movements of wages up or down tend to be uniform throughout the country. The competitive industrial group should therefore be taken as the smallest unit whose productivity need be considered in wage readjustments.

But we can not stop there. Many trades, such as machinists or carpenters, shift from one industry to another and the competitive effect of this shifting is to maintain a tendency toward uniform national rates for each craft. Furthermore, the "standard of living" is ordinarily measured as much by wage differentials between crafts as by actual quantitative standards. If one group of workers in a community secures a wage increase, other groups in other crafts or other industries will believe themselves entitled to a parallel increase, and will tend to refuse to work for less. The standards of living of the workers differ among the various groups, but the various standards tend to maintain a constant relation to each other, if they do not, indeed, approach uniformity. In the long run, the supply of labor for the more poorly paid occupations will shrink through the competition of the more attractive jobs. These tendencies work toward uniform changes in wage rates throughout all industries.

An influence still more basic is the interrelation between total production and the consuming power represented by wages. Let us imagine, for instance, the clothing industry suddenly doubling its productivity per person engaged, while the productivity of all other industries remained stationary. Then let us imagine that each clothing worker received an increase in wages corresponding to the increase in his productivity, while wages in all other industries remained stationary. What would happen? We may take up the possibilities separately.

(1) The clothing product doubles, but is sold at more than half its former price.

This is impossible because other workers would have no extra means to absorb all the extra clothing, and the clothing workers themselves could not absorb it. The bulk of their increase in wages would be spent for other commodities.

(2) The clothing product doubles, but is sold at half its former price.

The product could then be absorbed by the clothing industry itself would receive no benefit from the increase in productivity, and could not afford to pay any higher wages. This supposition is therefore impossible also.

(3) The total product remains the same as before, and is sold at the old price.

Half the clothing workers would then be unemployed and the net consuming power of the public would be depressed by that much, thus depressing by that much the production of other industries. This in turn would reduce the demand for clothing and decrease its production.

(4) The total product remains the same as before, and is sold at a lower price. This is practically impossible, since there would be little incentive for the manufacturer to lower the price except to meet a diminishing demand or to increase the sale.

We therefore arrive at the conclusion that increased productivity in any industry can be beneficial in the long run only if there is a general increase in consuming power. And, per contra, any increase in real wages in any one industry must depend on the general increase in productivity as well as upon the increase in that industry alone. As a matter of fact, no one industry has been chiefly responsible for the increase in average productivity. Table V shows that industrial groups have all shared in it.

In an effort to discover whether the course of wages in industrial group was closer to the course of the value-product in that group than to the course of the value-product industry as a whole, we have compared the index of total wages paid with the index of total value added by manufacture, both in the separate group and in industries as a whole. (Table VI.) This relation is the same as that between per capita wages and per capita value-product, since it would not affect the ratio if both figures were to be divided by the number of wage earners. In special cases, a disturbing element may arise from a movement of prices in the industrial group which diverges from the general price level; but since both wages and product are in terms of value, failure to correct for price fluctuations does not involve great error. Nineteen hundred and nine is chosen as the base. Group 13 (industries (small repair shops) and Group 14 (miscellaneous) are omitted, because in the former case the "value added" is an arbitrary figure computed from the labor cost and overhead, and in the latter no single industrial group is concerned.

TABLE V.—Index of physical production per wage earner in manufacturing industries of the United States, 1899-1914, and index of value-product per average yearly wage for census years (base, 1909=100).

| Year.     | Index of employment <sup>1</sup> | All manufacturing industries. |                                   |                                     | Group I.                   |                                   |                                     | Group II.                  |                                   |                                     |
|-----------|----------------------------------|-------------------------------|-----------------------------------|-------------------------------------|----------------------------|-----------------------------------|-------------------------------------|----------------------------|-----------------------------------|-------------------------------------|
|           |                                  | Wage earners. <sup>2</sup>    | Physical production. <sup>3</sup> | Per capita production. <sup>4</sup> | Wage earners. <sup>2</sup> | Physical production. <sup>3</sup> | Per capita production. <sup>4</sup> | Wage earners. <sup>2</sup> | Physical production. <sup>3</sup> | Per capita production. <sup>4</sup> |
| 1899..... | 90.0                             | 71.2                          | 81.2                              | 85.9                                | 73.3                       | 69.3                              | 94.5                                | 71.1                       | 67.0                              | 94.2                                |
| 1901..... | 88.5                             | 72.6                          | 81.8                              | 83.1                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1904..... | 90.5                             | 76.8                          | 88.8                              | 86.6                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1909..... | 100.0                            | 100.0                         | 100.0                             | 100.0                               | 100.0                      | 100.0                             | 100.0                               | 100.0                      | 100.0                             | 100.0                               |
| 1914..... | 90.7                             | 82.1                          | 78.8                              | 93.5                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1915..... | 88.2                             | 82.7                          | 75.4                              | 91.2                                | 88.1                       | 88.6                              | 105.6                               | 88.4                       | 77.6                              | 96.5                                |
| 1916..... | 89.7                             | 88.8                          | 80.9                              | 100.9                               | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1917..... | 94.5                             | 94.3                          | 94.9                              | 100.6                               | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1918..... | 95.5                             | 96.8                          | 96.7                              | 98.9                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1919..... | 85.2                             | 80.5                          | 81.2                              | 88.7                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1920..... | 91.4                             | 100.0                         | 100.0                             | 100.0                               | 100.0                      | 100.0                             | 100.0                               | 100.0                      | 100.0                             | 100.0                               |
| 1921..... | 92.5                             | 105.5                         | 101.6                             | 98.3                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1922..... | 89.2                             | 103.6                         | 96.9                              | 93.5                                | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1923..... | 90.4                             | 108.1                         | 111.0                             | 102.7                               | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1924..... | 107.1                            | 111.5                         | 114.5                             | 102.7                               | .....                      | .....                             | .....                               | .....                      | .....                             | .....                               |
| 1925..... | 84.2                             | 106.4                         | 104.9                             | 98.6                                | 120.4                      | 105.8                             | 87.9                                | 104.2                      | 105.4                             | 101.2                               |

<sup>1</sup> Percentage employed of estimated normal supply of nonagricultural workers, from "Fluctuations in unemployment in cities of the United States, 1922 to 1917," by Horrell Hart, Cincinnati, Helen S. Truett Foundation, 1918. This study was based on a large amount of data from various Federal and State Government sources. It includes transportation and mining as well as manufacturing, but the three census years are nearly parallel, and hence only a slight error is involved on this score. (Estimates from 1919-1921, inclusive.)

<sup>2</sup> By applying the percentages of employed in census years to the average number of wage earners in the years as given by the census, the total supply of workers in those years was derived. The total supply in intervening years was then calculated by interpolation. The yearly numbers of wage earners were then calculated by applying the index of employment to the yearly total supply, and the result was converted to the base, 1909=100.

<sup>3</sup> Day's index for manufacturing industries.

<sup>4</sup> Index of production divided by index of wage earners.

<sup>5</sup> Index derived directly from census figures. Interpolation for intervening years not attempted, since sufficiently accurate indices of employment for separate groups are not now available.

<sup>6</sup> Day's index for the group in question.

TABLE V.—Index of physical production per wage earner, etc.—Continued.

| Year.     | All manufacturing industries. |                             |                                     | Group I.                   |                             |                                     | Group II.                  |                             |                                     |
|-----------|-------------------------------|-----------------------------|-------------------------------------|----------------------------|-----------------------------|-------------------------------------|----------------------------|-----------------------------|-------------------------------------|
|           | Average wage. <sup>1</sup>    | Value-product. <sup>2</sup> | Per capita production. <sup>3</sup> | Average wage. <sup>1</sup> | Value-product. <sup>2</sup> | Per capita production. <sup>3</sup> | Average wage. <sup>1</sup> | Value-product. <sup>2</sup> | Per capita production. <sup>3</sup> |
| 1899..... | 92.2                          | 57                          | 69                                  | 82                         | 55                          | 67                                  | 81                         | 56                          | 69                                  |
| 1904..... | 92.1                          | 74                          | 80                                  | 92                         | 78                          | 78                                  | 88                         | 69                          | 78                                  |
| 1909..... | 100.0                         | 100                         | 100                                 | 100                        | 100                         | 100                                 | 100                        | 100                         | 100                                 |
| 1914..... | 111.9                         | 116                         | 104                                 | 110                        | 132                         | 120                                 | 109                        | 108                         | 99                                  |

| Year.     | Group III.    |                      |                        | Group IV.     |                      |                        | Group VII.    |                      |                        | Group VIII.   |                      |                        |
|-----------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|
|           | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. |
| 1899..... | 72.5          | 58.2                 | 80.3                   | 73.7          | 79.2                 | 107.5                  | 70.5          | 65.4                 | 92.8                   | 73.7          | 50.2                 | 68.1                   |
| 1904..... | 84.6          | 70.1                 | 82.3                   | 80.5          | 71.8                 | 89.2                   | 87.2          | 88.7                 | 99.4                   | 73.0          | 73.5                 | 86.5                   |
| 1909..... | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  |
| 1914..... | 103.3         | 93.9                 | 90.9                   | 91.4          | 80.6                 | 88.2                   | 112.5         | 118.4                | 105.0                  | 112.4         | 119.9                | 106.7                  |

| Year.     | Group III.    |                |                        | Group IV.     |                |                        | Group VII.    |                |                        | Group VIII.   |                |                        |
|-----------|---------------|----------------|------------------------|---------------|----------------|------------------------|---------------|----------------|------------------------|---------------|----------------|------------------------|
|           | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. |
| 1899..... | 84            | 60             | 71                     | 81            | 61             | 75                     | 87            | 59             | 68                     | 81            | 52             | 64                     |
| 1904..... | 91            | 74             | 81                     | 98            | 81             | 83                     | 96            | 74             | 77                     | 93            | 74             | 80                     |
| 1909..... | 100           | 100            | 100                    | 100           | 100            | 100                    | 100           | 100            | 100                    | 100           | 100            | 100                    |
| 1914..... | 110           | 104            | 98                     | 113           | 107            | 95                     | 113           | 108            | 96                     | 115           | 119            | 103                    |

| Year.     | Group IX.     |                      |                        | Group X.      |                      |                        | Group XI.     |                      |                        | Group XII.    |                      |                        |
|-----------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|---------------|----------------------|------------------------|
|           | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. | Wage earners. | Physical production. | Per capita production. |
| 1899..... | 67.6          | 71.1                 | 105.2                  | 64.4          | 51.9                 | 80.6                   | 79.6          | 69.6                 | 87.4                   | 66.0          | 28.2                 | 42.7                   |
| 1904..... | 83.1          | 84.2                 | 101.3                  | 73.6          | 73.4                 | 62.2                   | 85.2          | 86.9                 | 73.9                   | 81.3          | 67.6                 | 67.9                   |
| 1909..... | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  | 100.0         | 100.0                | 100.0                  |
| 1914..... | 97.6          | 103.8                | 106.4                  | 104.8         | 100.0                | 99.2                   | 107.2         | 114.7                | 107.0                  | 128.6         | 100.5                | 143.1                  |

| Year.     | Group IX.     |                |                        | Group X.      |                |                        | Group XI.     |                |                        | Group XII.    |                |                        |
|-----------|---------------|----------------|------------------------|---------------|----------------|------------------------|---------------|----------------|------------------------|---------------|----------------|------------------------|
|           | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. | Average wage. | Value-product. | Per capita production. |
| 1899..... | 80            | 53             | 66                     | 87            | 63             | 72                     | 87            | 71             | 82                     | 79            | 49             | 62                     |
| 1904..... | 94            | 77             | 82                     | 94            | 76             | 81                     | 96            | 83             | 89                     | 89            | 66             | 63                     |
| 1909..... | 100           | 100            | 100                    | 100           | 100            | 100                    | 100           | 100            | 100                    | 100           | 100            | 100                    |
| 1914..... | 111           | 108            | 97                     | 108           | 113            | 105                    | 106           | 118            | 111                    | 126           | 176            | 140                    |

<sup>1</sup> From U. S. Census of Manufactures. Wage payments for year divided by average number of wage earners and reduced to base.

<sup>2</sup> Value added by manufacture, from U. S. Census of Manufactures, reduced to base.

<sup>3</sup> Value, product divided by average wage, to give per capita product in terms of value.

<sup>4</sup> Main industrial groups as classified by Census of Manufactures. (For titles, see Table III.)

<sup>5</sup> Groups V and VI are omitted because Day was unable to construct satisfactory group indices for them.

TABLE VI.—*Indices of wages in 12 main industrial groups compared with indices of value added by manufacture in each of these groups and with value added by manufacture of industries as a whole (base, 1909=100).*

| Group.                                                   | 1899 | 1904 | 1909 | 1914 |
|----------------------------------------------------------|------|------|------|------|
| All manufacturing industries:                            |      |      |      |      |
| Index of wages.....                                      | 57   | 74   | 100  | 116  |
| Index of value added.....                                | 59   | 76   | 100  | 119  |
| I. Food and kindred products:                            |      |      |      |      |
| Index of wages.....                                      | 60   | 79   | 100  | 133  |
| Index of value added.....                                | 53   | 72   | 100  | 132  |
| II. Textiles and their products:                         |      |      |      |      |
| Index of wages.....                                      | 58   | 71   | 100  | 114  |
| Index of value added.....                                | 56   | 69   | 100  | 108  |
| III. Iron and steel and their products:                  |      |      |      |      |
| Index of wages.....                                      | 61   | 77   | 100  | 114  |
| Index of value added.....                                | 60   | 74   | 100  | 108  |
| IV. Lumber and its remanufactures:                       |      |      |      |      |
| Index of wages.....                                      | 60   | 79   | 100  | 104  |
| Index of value added.....                                | 61   | 81   | 100  | 107  |
| V. Leather and its finished products:                    |      |      |      |      |
| Index of wages.....                                      | 65   | 78   | 100  | 109  |
| Index of value added.....                                | 57   | 76   | 100  | 109  |
| VI. Paper and printing:                                  |      |      |      |      |
| Index of wages.....                                      | 58   | 77   | 100  | 122  |
| Index of value added.....                                | 54   | 77   | 100  | 120  |
| VII. Liquors and beverages:                              |      |      |      |      |
| Index of wages.....                                      | 62   | 84   | 100  | 129  |
| Index of value added.....                                | 59   | 74   | 100  | 108  |
| VIII. Chemicals and allied products:                     |      |      |      |      |
| Index of wages.....                                      | 60   | 79   | 100  | 130  |
| Index of value added.....                                | 52   | 74   | 100  | 119  |
| IX. Stone, clay, and glass products:                     |      |      |      |      |
| Index of wages.....                                      | 54   | 78   | 100  | 109  |
| Index of value added.....                                | 53   | 77   | 100  | 109  |
| X. Metals and metal products, other than iron and steel: |      |      |      |      |
| Index of wages.....                                      | 56   | 75   | 100  | 114  |
| Index of value added.....                                | 63   | 76   | 100  | 113  |
| XI. Tobacco manufactures:                                |      |      |      |      |
| Index of wages.....                                      | 69   | 90   | 100  | 112  |
| Index of value added.....                                | 71   | 85   | 100  | 118  |
| XII. Vehicles for land transportation:                   |      |      |      |      |
| Index of wages.....                                      | 52   | 60   | 100  | 163  |
| Index of value added.....                                | 49   | 56   | 100  | 176  |

TABLE VII.—*Difference between index of value added by manufacture and index of wages in each main industrial group, compared with difference between index of value added in all industries and index of wages in each group.*

| Group.                                                                  | 1899 | 1904 | 1909 | 1914 |
|-------------------------------------------------------------------------|------|------|------|------|
| 1. Food and kindred products:                                           |      |      |      |      |
| Both indices of the group in question.....                              | -3   | -7   | 0    | -1   |
| Index of value for all manufacturing, less index of wages in group..... | -3   | -5   | 0    | -17  |
| 2. Textiles and their products:                                         |      |      |      |      |
| Both indices of the group in question.....                              | -2   | -2   | 0    | -6   |
| Index of value for all manufacturing, less index of wages in group..... | -1   | 3    | 0    | 2    |
| 3. Iron and steel and their products:                                   |      |      |      |      |
| Both indices of the group in question.....                              | -1   | -3   | 0    | -6   |
| Index of value for all manufacturing, less index of wages in group..... | -4   | -3   | 0    | 2    |
| 4. Lumber and its remanufactures:                                       |      |      |      |      |
| Both indices of the group in question.....                              | 1    | 2    | 0    | 3    |
| Index of value for all manufacturing, less index of wages in group..... | -3   | -5   | 0    | 12   |
| 5. Leather and its finished products:                                   |      |      |      |      |
| Both indices of the group in question.....                              | -8   | -2   | 0    | 0    |
| Index of value for all manufacturing, less index of wages in group..... | -8   | -4   | 0    | 7    |
| 6. Paper and printing:                                                  |      |      |      |      |
| Both indices of the group in question.....                              | -4   | 0    | 0    | -2   |
| Index of value for all manufacturing, less index of wages in group..... | -3   | -3   | 0    | -8   |
| 7. Liquors and beverages:                                               |      |      |      |      |
| Both indices of the group in question.....                              | -3   | -10  | 0    | -21  |
| Index of value for all manufacturing, less index of wages in group..... | -6   | -10  | 0    | -17  |
| 8. Chemicals and allied products:                                       |      |      |      |      |
| Both indices of the group in question.....                              | -8   | -5   | 0    | -21  |
| Index of value for all manufacturing, less index of wages in group..... | -3   | -5   | 0    | -14  |
| 9. Stone, clay, and glass products:                                     |      |      |      |      |
| Both indices of the group in question.....                              | -3   | -1   | 0    | -21  |
| Index of value for all manufacturing, less index of wages in group..... | -3   | -4   | 0    | -14  |
| 10. Metals other than iron and steel:                                   |      |      |      |      |
| Both indices of the group in question.....                              | -7   | 1    | 0    | -1   |
| Index of value for all manufacturing, less index of wages in group..... | 1    | -1   | 0    | 2    |
| 11. Tobacco manufactures:                                               |      |      |      |      |
| Both indices of the group in question.....                              | 2    | -5   | 0    | 6    |
| Index of value for all manufacturing, less index of wages in group..... | -12  | -26  | 0    | 13   |
| 12. Vehicles for land transportation:                                   |      |      |      |      |
| Both indices of the group in question.....                              | -3   | -4   | 0    | 4    |
| Index of value for all manufacturing, less index of wages in group..... | 5    | 14   | 0    | -47  |

TABLE VIII.—*Total physical production of the United States per capita of population<sup>1</sup> compared with physical production of manufacturing industries per capita of wage earners.<sup>2</sup> 1899-1914.*

| Year.     | Total per capita production. | All industries. | Physical production per capita for wage earners for— |          |          |          |          |          |          |          |          |           |           |           |
|-----------|------------------------------|-----------------|------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
|           |                              |                 | Group 1.                                             | Group 2. | Group 3. | Group 4. | Group 5. | Group 6. | Group 7. | Group 8. | Group 9. | Group 10. | Group 11. | Group 12. |
| 1899..... | 84                           | 83.9            | 94.5                                                 | 94.2     | 80.3     | 107.5    | 92.8     | 68.1     | 105.2    | 80.6     | 87.4     | 42.7      |           |           |
| 1900..... | 84                           | 83.1            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1901..... | 84                           | 89.6            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1902..... | 94                           | 100.4           | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1903..... | 92                           | 93.5            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1904..... | 92                           | 91.3            | 100.6                                                | 96.5     | 82.9     | 89.3     | 99.4     | 84.5     | 101.5    | 92.2     | 91.5     | 77.9      |           |           |
| 1905..... | 101                          | 100.9           | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1906..... | 101                          | 100.6           | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1907..... | 101                          | 98.9            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1908..... | 91                           | 89.7            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1909..... | 102                          | 100.0           | 100.0                                                | 100.0    | 100.0    | 100.0    | 100.0    | 100.0    | 100.0    | 100.0    | 100.0    | 100.0     |           |           |
| 1910..... | 103                          | 96.5            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1911..... | 96                           | 93.5            | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1912..... | 109                          | 102.7           | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1913..... | 105                          | 102.7           | .....                                                | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....    | .....     |           |           |
| 1914..... | 102                          | 98.6            | 87.9                                                 | 101.2    | 93.9     | 88.2     | 100.5    | 106.7    | 106.4    | 99.2     | 107.0    | 143.1     |           |           |

<sup>1</sup> From Table I, base, 1909=13.<sup>2</sup> From Table V (base 1909). The difference in base accounts for part of the difference between the two indices.

It must be noted that the smaller the group, the greater the probability of error in the figures in the above table. Total per capita production is derived from Census figures for the population, the Day's index of production for agriculture, mining, and manufacturing combined, which has a broad foundation of data. The figures for wage earners in manufacturing industries, however, are much more doubtful, as is the index of production for the individual groups may easily be considerably altered by the development of fuller information. In some cases they are based almost entirely on raw materials used, thus ignoring elaboration of manufacturing processes. If, for instance, one should measure the increased per capita production in manufactured foods caused by the wide introduction of prepared breakfast foods, using as the index the bushels of grain consumed rather than cartons of finished product, a decrease in productivity per wage earner would doubtless appear, where in reality a large increase took place.

Table VII shows the differences in each case. It is evident at once that the greatest variations occurred in 1914. This was undoubtedly due to the depression of that year, with its irregular movements of production and prices. Leaving the 1914 column out of consideration, in most of the groups wages follow the product of the group a little more closely than that of industries as a whole, though the differences are slight except in groups 11 and 12. In both these groups (tobacco manufacture and vehicles for land transportation) there were very marked changes in the character of the technical process, so that productivity and wages took different courses from that in industries as a whole.

Our analysis has not proceeded far enough to enable us to derive any exact formula for the relation of wages in a particular industrial group to productivity in that group on the one hand and to total manufacturing productivity on the other. We can say, however, that in all cases except where an extraordinary change in industrial technique has taken place, it would in the long run make little practical difference whether either index were used alone or both were used in any possible combination. Table VIII compares the total production of the country per capita of the population with total production of manufacturing industries per capita of persons engaged, and with production of the various industrial groups per capita of persons engaged, so far as the latter can be derived from census figures.

From this analysis it is justifiable to draw the following conclusions:

That while no exact formula has been developed, it would be more scientific to apply the index of productivity for the entire Nation, or for all manufacturing industries, in determining real wages in any specific case than to regulate wages merely by changes in the cost of living or by the chance changes of wages in "neighboring plants."

2. *Methods of production measurement.*—As the accumulation of statistics becomes more complete, it will be possible to work out more accurate methods of production measurement. For the present we can depend on such indices as those of Doctors Stewart and Day for the production of large industrial groups.

In order to measure the production of any competitive industrial group such as might be involved in a specific collective bargaining arrangement, various methods may be suggested, according to the case. If the product is sufficiently uniform so that it can be measured in commodity units (such as steel billets) that is undoubtedly the best method. If, on the other hand, it is widely varied, as in printing or clothing, an accounting method may be the best. Such a method might, for instance, find the total net sales for the group, and then deflate the result by an index of factory prices for the products of the industry. This, with careful statistical method, would give a fairly accurate index of physical production.

The case of Government arsenals and navy yards is a peculiarly difficult one, since the product is extremely varied, and accounting methods can not be applied, the product having no exchange or market value.

Until some more accurate method is devised we recommend the use for determining wages in Government arsenal and navy yards, of the index of production per capita for the whole country. This, being calculated on a larger base of data than any index now available for smaller industrial groups, is likely to be approximately correct; we have already demonstrated that use of the total index would involve no great error if applied to a specific industry.

3. *Method of applying index of production to wages.*—The simplest way of applying an index of production to wage determination is, of course, to apply the percentage increase to the existing wage rates of the various classes. This avoids all problems which would be involved in any attempt to set a new basis or to alter wage differentials among classes. At some time in the future, after economic research has delved further into the subject, the unions may be prepared to demonstrate that the present wage basis does not represent a sufficiently large share of the Nation's income, and increases may be demanded on that ground. For the present, however, that contention is waived, and the employees confine themselves to the argument that they can not in the future accept less than their present share of the national product. In order to maintain their present share it is, of course, necessary to increase real wages by the percentage increase which from time to time takes place in production per wage earner. Surely no reasonable person would dispute the justice of that proposal. The proper method, in detail, would be as follows:

(a) As a preliminary, a minimum wage should be established below which no adult worker should be permitted to fall. The basis upon which this wage should be calculated is a budget of yearly expenditures defined by the United States Bureau of Labor Statistics as the minimum of health and decency level for a worker's family of five. The various articles and quantities making up this budget can be found in the Monthly Labor Review for June, 1920. This budget should be actually priced in the localities of the wage adjustment at the time of each adjustment. It is, of course, merely a minimum and will serve to maintain at the lowest level of wages a standard of living not incompatible with American citizenship. Authorities in plenty could be quoted in favor of the "living wage" minimum, but since many of these authorities have been spokesmen for the Government itself, it is hardly worth while to take up the time of Government officials in justifying a principle which is now officially accepted.

(b) At the time of each adjustment, the wage rates established at the last adjustment should be modified by the percentage change in the cost of living since the last adjustment. Department of Labor figures for this change should be used, consisting of retail prices weighted according to the importance of the various items in the family budget. This modification is not for the purpose of fixing new wage rates, but merely for the purpose of establishing in terms of the new price level, and as a base for computation, the real wages awarded at the last adjustment.

(c) The existing real wage rates as defined in (b) should then be modified by the percentage increase in per capita production. This will give the wage rates for the new period.

The percentage increase in per capita production should not, of course, be reckoned simply from year to year. Owing to the fluctuations of the business cycle, some years show abnormal increases in production, while others show decreases. Wages, of course, do not fluctuate as violently as prices or pro-

duction, and it is not desirable that they should. To decrease real wages during a depression, and then to increase them rapidly during the following period when production picks up again would be an undue hardship to the wage-earner, and would, by its reaction on the market, intensify every undesirable feature of the business cycle. The trend of production which it is desirable to apply to wage determination is not the cyclical one due to booms and depressions, but the steady average increase over a period of years.

In order to obtain the percentage of average increase we suggest a 10-year moving average. This is long enough to include the whole course of the business cycle—both upward and downward swings—its average length being about seven years. Table IX shows the yearly percentage increases or decreases in per capita production for both the Stewart and Day indices, together with yearly percentage of average increases for the preceding 10 years. It will be seen that while the yearly change fluctuates between 13.5 and -0.9, the average change fluctuates only between 3 and 0.8. A yearly addition to real wages corresponding to the average change in productivity would not be an inconvenience to any solvent concern; yet the cumulative effects of these changes, if applied from 1908 to 1919, would have been to raise real wages, by the Stewart index 20.24 per cent and by the Day index 20.95. It should be borne clearly in mind that these increases in wages would not be mere modifications due to changes in the price level, but would represent actual increases in purchasing power, whatever the level of prices. Table X shows similar indices for manufacturing industries alone.

TABLE IX.—Yearly increases in per capita physical production for the United States and 10-year moving averages of these increases.

| Year.     | Yearly increases. |           | 10-year moving average increases. |           |
|-----------|-------------------|-----------|-----------------------------------|-----------|
|           | Stewart.          | Day.      | Stewart.                          | Day.      |
|           | Per cent.         | Per cent. | Per cent.                         | Per cent. |
| 1899..... | 0.0               | 0.0       | .....                             | .....     |
| 1900..... | 0                 | 0         | .....                             | .....     |
| 1901..... | 0                 | 0         | .....                             | .....     |
| 1902..... | 12.0              | 12.0      | .....                             | .....     |
| 1903..... | -4.3              | -2.1      | .....                             | .....     |
| 1904..... | 4.4               | 0         | .....                             | .....     |
| 1905..... | 5.3               | 9.8       | .....                             | .....     |
| 1906..... | 4.0               | 5.0       | .....                             | .....     |
| 1907..... | -3.9              | -4.7      | .....                             | .....     |
| 1908..... | -7.1              | -9.9      | 1.0                               | 1.0       |
| 1909..... | 9.8               | 12.1      | 2.0                               | 2.2       |
| 1910..... | 0                 | 8         | 2.0                               | 2.2       |
| 1911..... | -4.9              | -6.8      | 1.5                               | 1.5       |
| 1912..... | 12.5              | 13.5      | 1.6                               | 1.6       |
| 1913..... | -6.5              | -3.7      | 1.4                               | 1.5       |
| 1914..... | -9                | -2.9      | 1.8                               | 1.2       |
| 1915..... | 9.0               | 5.9       | 1.2                               | .8        |
| 1916..... | 3.7               | 4.6       | 2.0                               | 2.2       |
| 1917..... | 4.4               | 8.8       | 2.0                               | 2.2       |
| 1918..... | 0                 | -1.8      | 2.7                               | 3.0       |
| 1919..... | -5.0              | -6.3      | 1.2                               | 1.0       |

TABLE X.—Yearly increases in per capita physical production for manufacturing industries, and 10-year moving average of these increases.

| Year.     | Yearly increases. | 10-year moving average increase. | Year.     | Yearly increases. | 10-year moving average increase. |
|-----------|-------------------|----------------------------------|-----------|-------------------|----------------------------------|
|           |                   |                                  |           |                   |                                  |
| Per cent. | Per cent.         |                                  | Per cent. | Per cent.         |                                  |
| 1899..... | -5.6              | .....                            | 1907..... | -1.7              | .....                            |
| 1900..... | -0.9              | .....                            | 1908..... | -9.3              | .....                            |
| 1901..... | 5.0               | .....                            | 1909..... | 11.7              | 1.76                             |
| 1902..... | 12.1              | .....                            | 1910..... | -3.7              | 1.48                             |
| 1903..... | -6.9              | .....                            | 1911..... | -2.9              | .69                              |
| 1904..... | 12.5              | .....                            | 1912..... | 9.8               | .46                              |
| 1905..... | 12.5              | .....                            | 1913..... | 10.6              | 1.15                             |
| 1906..... | -0.3              | .....                            | 1914..... | -4.0              | .75                              |

Let us analyze for a moment the effect of the above method of wage determination. It may at first appear that there is something illogical in modifying a money wage by an index of physical production. But a moment's reflection will show that there is no difficulty here. A worker's wage at any given time represents the power to purchase certain quantities of certain goods. If that wage is modified by the cost of living index it means that after the modification he will be able to buy, at the new price level, exactly the same quantities of the same goods as before. In essence, therefore, he has been receiving a fixed commodity wage. But in the meantime the physical production of the Nation has been increasing per capita. If the wage earner is to absorb his accustomed share of the total product, his real wages must therefore be increased by exactly the percentage by which physical production per capita has increased. Since the new volume of production is being distributed at the new price level, the percentage addition to his real wages can be made in terms of dollars and cents, after the cost of living adjustment.

It is sometimes said that increased production will increase the welfare of the workers, not by raising wages but by lowering prices. The suggested system of determining wages would merely translate such a process into concrete terms. If increased production does lower prices, that fact will be accounted for when the wage rate is modified by the cost-of-living index.

The addition to the wage then made for increased productivity will bring the modified wage up to the point where it can perform its former share in absorbing the total production. If, on the other hand, increased production would not lower prices, the wage base will be adjusted to the price level wherever it may be, and the increment added for production will then assure the worker of his former share of the product.

As an example of the operation of this process let us begin with a yearly wage of \$2,000. Suppose it were ascertained at an annual adjustment that the cost of living had risen 10 per cent and the 10-year average for annual increase of per capita production were 2 per cent. The adjusted base would be found by adding 10 per cent for the increased cost of living, and it would be \$2,200. The new wage would then be determined by adding 2 per cent to the adjusted base, and it would be \$2,244.

At the succeeding annual adjustment this would be the figure to start from. If the cost of living had then declined to the point where it had been before the first adjustment that decline measured in terms of percentage would be 1 per cent. Subtracting this from \$2,244 we get \$2,042 as the adjusted base, and adding 2 per cent we find \$2,083 as the new wage. This wage, at the same price level as that of two years before, has a net increased purchasing power, due solely to higher productivity, of a little over 4 per cent (represented in money by 88¢).

In operating this method it is important to make frequent adjustment—at periods not more than a year apart—in order that the workers may not be handicapped by too great fluctuations of purchasing power. Adjustments necessitated by a rising cost of living should not be delayed, for instance, as they were during the war, because of a belief that the cost of living is soon coming down again. Such delay would be excusable only if there were to be no attempt to keep wages in some fairly constant relation to productivity.

#### D. ESTIMATE OF THE PROBABLE EFFECTS OF THIS METHOD OF FIXING WAGES.

1. *The past course of real wages.*—It may be asked, if in the past wages have borne a constant relation to the value product of industry without the establishment of any special principle of determining them, will not the same process continue in the future without employing any basis of wage determination but the prevalent market rate? It must be remembered, however, that in comparing wages with figures of "value added by manufacture" we are speaking in terms of value, in other words, in terms of prices, and that the prices in this case are wholesale prices. For "value added by manufacture" is obtained by subtracting the cost of materials from the sales price at the factory. But in order to assess wages, not in relation to the value product of manufacturing industry, but in relation to their purchasing power for the individual worker, we must relate them to retail prices, or, in other words, investigate the course of "real wages."

Dr. I. M. Rubinow published "The recent trend of real wages" in the American Economic Review of December, 1914, in which he compared full-time weekly earnings and hourly rates with their purchasing power in terms

of food prices. Food prices were used because the expense of food comprises nearly half the family budget, and because the retail price level of other articles seems to vary about as the retail prices of foodstuffs. The wage figures were derived both from union minimum-wage scales and from actual wage payments in several industries, as published by the Department of Labor. The result shows that real wages, both for the hour and the full-time week, showed a rising trend from 1890 to 1896 and a falling trend from then to 1912. (See Table XI. It should be noted that all the figures in this table are index numbers rather than absolute quantities. For the full paper, see Appendix F.)

TABLE XI.—I. M. Rubinow's computation of index of real wages, 1890-1912.<sup>1</sup>

| Year.     | Hours per week. | Wages per hour. | Full-time weekly earnings per employee. | Retail prices of food. | Purchasing power measured by retail prices of food. |                  |
|-----------|-----------------|-----------------|-----------------------------------------|------------------------|-----------------------------------------------------|------------------|
|           |                 |                 |                                         |                        | Hourly wages.                                       | Weekly earnings. |
| 1890..... | 101.1           | 100.2           | 101.3                                   | 101.9                  | 98.3                                                | 99.4             |
| 1891..... | 100.9           | 99.9            | 100.8                                   | 103.4                  | 96.6                                                | 97.5             |
| 1892..... | 100.7           | 100.3           | 100.0                                   | 104.7                  | 94.9                                                | 95.9             |
| 1893..... | 100.4           | 101.2           | 101.6                                   | 104.1                  | 97.2                                                | 97.6             |
| 1894..... | 99.2            | 98.9            | 98.1                                    | 99.2                   | 99.7                                                | 99.6             |
| 1895..... | 98.8            | 98.6            | 99.2                                    | 97.1                   | 101.5                                               | 102.2            |
| 1896..... | 99.7            | 100.0           | 99.7                                    | 95.2                   | 105.0                                               | 104.7            |
| 1897..... | 99.5            | 99.6            | 99.1                                    | 96.7                   | 105.0                                               | 102.5            |
| 1898..... | 99.7            | 100.2           | 99.8                                    | 99.7                   | 100.5                                               | 100.1            |
| 1899..... | 99.2            | 101.4           | 100.6                                   | 100.8                  | 100.6                                               | 99.8             |
| 1900..... | 98.6            | 100.7           | 100.2                                   | 103.9                  | 101.6                                               | 100.2            |
| 1901..... | 98.1            | 107.0           | 105.0                                   | 108.5                  | 98.6                                                | 98.8             |
| 1902..... | 97.4            | 112.0           | 109.1                                   | 114.6                  | 97.7                                                | 94.3             |
| 1903..... | 96.7            | 115.5           | 111.7                                   | 114.7                  | 100.7                                               | 97.3             |
| 1904..... | 96.0            | 116.3           | 111.6                                   | 116.2                  | 100.0                                               | 96.0             |
| 1905..... | 96.0            | 119.6           | 114.8                                   | 116.4                  | 102.5                                               | 98.5             |
| 1906..... | 95.4            | 123.6           | 117.9                                   | 120.3                  | 102.7                                               | 98.0             |
| 1907..... | 95.1            | 129.3           | 123.0                                   | 125.9                  | 102.7                                               | 97.7             |
| 1908..... | 94.5            | 125.5           | 121.4                                   | 130.1                  | 98.8                                                | 83.0             |
| 1909..... | 94.4            | 129.9           | 122.6                                   | 137.2                  | 94.7                                                | 89.4             |
| 1910..... | 93.8            | 134.0           | 125.7                                   | 144.1                  | 85.6                                                | 87.2             |
| 1911..... | 93.2            | 136.3           | 127.2                                   | 148.0                  | 85.3                                                | 88.9             |
| 1912..... | 93.0            | 141.5           | 131.6                                   | 154.2                  | 91.8                                                | 83.3             |

<sup>1</sup> From "The recent trend of real wages," by I. M. Rubinow, American Economic Review, December, 1914. All columns in the table are, of course, relative numbers, and do not represent actual hours, wages, etc.

TABLE XII.—Paul Douglas's computation of real wages, 1890-1918.<sup>1</sup>

| Year.     | Hours per week. | Wages per hour. | Full-time weekly wages. | Retail food prices. | Purchasing power measured by retail prices of food, of— |                            |
|-----------|-----------------|-----------------|-------------------------|---------------------|---------------------------------------------------------|----------------------------|
|           |                 |                 |                         |                     | Wages per hour.                                         | Full-time weekly earnings. |
| 1890..... | 100.9           | 99.4            | 100.3                   | 101.9               | 97.5                                                    | 98.4                       |
| 1891..... | 100.8           | 99.1            | 100.1                   | 103.4               | 96.0                                                    | 96.8                       |
| 1892..... | 100.3           | 101.1           | 100.9                   | 104.6               | 98.3                                                    | 96.3                       |
| 1893..... | 100.3           | 101.1           | 101.4                   | 104.1               | 97.1                                                    | 97.5                       |
| 1894..... | 99.9            | 98.0            | 97.9                    | 99.2                | 98.8                                                    | 98.7                       |
| 1895..... | 99.4            | 98.2            | 98.5                    | 97.1                | 101.1                                                   | 101.2                      |
| 1896..... | 99.7            | 100.2           | 99.9                    | 95.2                | 103.3                                                   | 104.6                      |
| 1897..... | 99.5            | 100.2           | 99.7                    | 96.7                | 103.6                                                   | 104.2                      |
| 1898..... | 99.2            | 103.9           | 100.2                   | 99.7                | 101.2                                                   | 100.5                      |
| 1899..... | 98.7            | 102.4           | 101.1                   | 103.8               | 101.6                                                   | 100.3                      |
| 1900..... | 97.9            | 106.8           | 104.6                   | 103.7               | 101.6                                                   | 97.6                       |
| 1901..... | 97.5            | 108.7           | 105.9                   | 108.5               | 100.1                                                   | 97.6                       |
| 1902..... | 96.6            | 112.9           | 109.0                   | 114.6               | 98.5                                                    | 97.6                       |
| 1903..... | 96.1            | 117.2           | 112.1                   | 118.7               | 102.2                                                   | 97.6                       |
| 1904..... | 95.4            | 118.2           | 112.6                   | 116.2               | 101.7                                                   | 96.9                       |
| 1905..... | 95.4            | 120.0           | 114.4                   | 116.4               | 103.1                                                   | 98.3                       |

<sup>1</sup> From American Economic Review, September, 1921.

TABLE XII.—Paul Douglas's computation of real wages, 1890-1918—Continued.

| Year.     | Hours per week. | Wages per hour. | Full-time weekly wages. | Retail food prices. | Purchasing power measured by retail prices of food, of— |                            |
|-----------|-----------------|-----------------|-------------------------|---------------------|---------------------------------------------------------|----------------------------|
|           |                 |                 |                         |                     | Wages per hour.                                         | Full-time weekly earnings. |
| 1909..... | 94.8            | 125.1           | 118.6                   | 120.3               | 103.9                                                   | 98.6                       |
| 1907..... | 94.3            | 131.2           | 123.7                   | 125.9               | 104.2                                                   | 98.2                       |
| 1908..... | 93.6            | 131.6           | 123.1                   | 130.1               | 101.2                                                   | 94.6                       |
| 1909..... | 93.4            | 133.4           | 124.4                   | 137.2               | 97.2                                                    | 90.7                       |
| 1910..... | 92.5            | 137.0           | 126.5                   | 144.1               | 95.1                                                    | 87.8                       |
| 1911..... | 92.2            | 136.8           | 126.9                   | 145.0               | 97.8                                                    | 90.1                       |
| 1912..... | 91.1            | 145.9           | 132.0                   | 154.2               | 94.6                                                    | 85.9                       |
| 1913..... | 90.6            | 140.6           | 133.2                   | 155.7               | 96.1                                                    | 86.8                       |
| 1914..... | 90.1            | 153.1           | 137.9                   | 158.5               | 96.5                                                    | 87.0                       |
| 1915..... | 86.2            | 152.5           | 133.5                   | 156.5               | 97.5                                                    | 86.6                       |
| 1916..... | 83.7            | 164.5           | 144.8                   | 177.6               | 92.6                                                    | 80.8                       |
| 1917..... | 88.5            | 167.0           | 146.9                   | 233.4               | 71.6                                                    | 64.0                       |
| 1918..... | 88.5            | 211.3           | 187.7                   | 266.6               | 79.3                                                    | 70.4                       |

Chart No. 3.

TREND OF PER CAPITA PRODUCTION COMPARED WITH TREND OF PURCHASING POWER OF WAGES, 1890-1918.

Data from Tables I and XII.

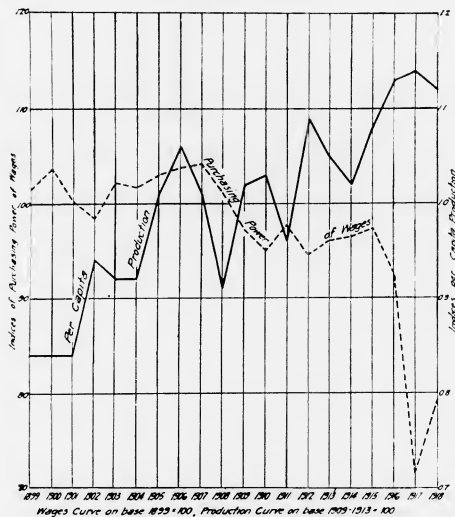


TABLE XIII.—Indices of union wage scales, cost of living, and real wages, 1907-1920.

| Year.     | Wages <sup>1</sup> (full-time weekly). | Cost of living, <sup>2</sup> | Retail food prices, <sup>3</sup> | Real wages.     |                     |
|-----------|----------------------------------------|------------------------------|----------------------------------|-----------------|---------------------|
|           |                                        |                              |                                  | Cost of living. | Retail food prices. |
| 1907..... | 92                                     | .....                        | 82                               | .....           | 112                 |
| 1908..... | 93                                     | .....                        | 80                               | .....           | 111                 |
| 1909..... | 95                                     | .....                        | 86                               | .....           | 102                 |
| 1910..... | 95                                     | .....                        | 93                               | .....           | 104                 |
| 1911..... | 98                                     | .....                        | 98                               | .....           | 100                 |
| 1912..... | 100                                    | .....                        | 100                              | .....           | 100                 |
| 1913..... | 102                                    | .....                        | 103.0                            | .....           | 100                 |
| 1914..... | 102                                    | .....                        | 105.1                            | .....           | 97                  |
| 1915..... | 106                                    | .....                        | 118.3                            | .....           | 82                  |
| 1916..... | 112                                    | .....                        | 142.4                            | .....           | 79                  |
| 1917..... | 139                                    | .....                        | 174.4                            | .....           | 77                  |
| 1918..... | 148                                    | .....                        | 196.3                            | .....           | 74                  |
| 1919..... | 189                                    | .....                        | 209.4                            | .....           | 59                  |
| 1920..... | .....                                  | .....                        | .....                            | .....           | .....               |

<sup>1</sup> Changes in union wage scales, Monthly Labor Review, U. S. Department of Labor, March, 1921. The figures are for May of each year.<sup>2</sup> Index based on retail prices weighted according to their importance in the family budget. Monthly Labor Review, U. S. Department of Labor.<sup>3</sup> Retail food prices, Monthly Labor Review, U. S. Department of Labor, April, 1921.

Dr. Paul M. Douglass, of the university of Chicago, using approximately the same method as Doctor Rubirow, has brought the table down to 1918, showing a continuation of the falling trend of real wages. See Table XII and Appendix 4. This paper, in complete form, will be published in the September, 1921, issue of the American Economic Review.

In Table XIII we have compared the index of union wage rates for a full-time week as compiled by the United States Department of Labor with both the retail food price index and the total cost of living index from the time of its inception in 1913 down to 1920. By either test the real wages for a full-time week have shown a decreasing trend. (The 1920 figures were approximately at the peak, being accumulated in the first half of the year. They therefore do not take account of subsequent reductions.)

In Table XIV we have made the same calculations for mechanists' wage scales. These also show a falling trend.

Two criticisms of the preceding tables may be made. One is that they give an undue preponderance to union wages rather than to wages in industries as a whole; the other is that they do not include extra payments for overtime, which have formed, at least during war years, a large part of the workman's income. To the first objection the theoretical answer may be made that it is hardly conceivable that the wages of unorganized workers, who have not the advantage of collective bargaining, would show over any long period a higher percentage of increase than the wages of organized workers. To the second objection we may answer that the hourly rate as well as the full-time earnings indicates a decrease in real wages, and therefore the decrease can not be accounted for on the basis of shorter standard hours. If workmen had to give more work to get the same return in purchasing power, their real wages did decrease by any sound test.

TABLE XIV.—Indices of machinists' wages, cost of living, and machinists' real wages, 1907–1920.

| Year.     | Machinists' wages rates. <sup>1</sup> | Cost of living. <sup>2</sup> | Food prices. <sup>2</sup> | Real wages.     |       |
|-----------|---------------------------------------|------------------------------|---------------------------|-----------------|-------|
|           |                                       |                              |                           | Cost of living. | Food. |
| 1907..... | 92                                    | 82                           | 82                        | 112             | 112   |
| 1908..... | 94                                    | 84                           | 84                        | 112             | 112   |
| 1909..... | 95                                    | 85                           | 85                        | 106             | 106   |
| 1910..... | 96                                    | 86                           | 86                        | 103             | 103   |
| 1911..... | 99                                    | 92                           | 92                        | 108             | 108   |
| 1912..... | 96                                    | 88                           | 88                        | 101             | 101   |
| 1913..... | 100                                   | 100                          | 100                       | 100             | 100   |
| 1914..... | 102                                   | 102                          | 101                       | 99              | 99    |
| 1915..... | 102                                   | 101                          | 105.1                     | 101             | 97    |
| 1916..... | 116                                   | 114                          | 118.3                     | 88              | 95    |
| 1917..... | 125                                   | 140                          | 142.4                     | 84              | 86    |
| 1918..... | 159                                   | 168                          | 174.4                     | 95              | 91    |
| 1919..... | 174                                   | 186                          | 196.5                     | 94              | 87    |
| 1920..... | 185                                   | 203                          | 203                       | 96              | 96    |

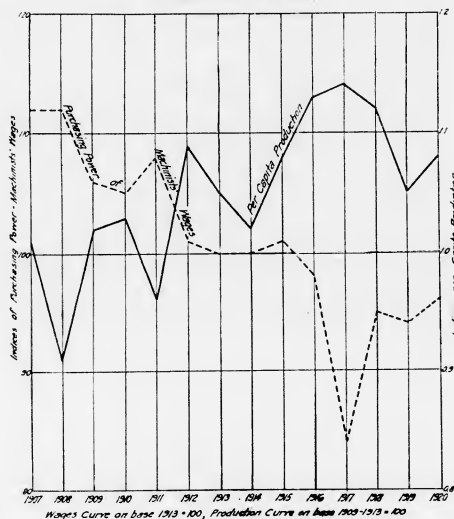
<sup>1</sup> United States Department of Labor figures for full-time working week, union wage scales, for all cities in United States reporting.

<sup>2</sup> Same as in Table XIII.

Chart No. 4.

TREND OF PER CAPITA PRODUCTION COMPARED WITH TREND OF PURCHASING POWER OF MACHINISTS' WAGES, 1907–1920.

Data from Tables I and XIV.



Wages Curve on base 1913 = 100, Production Curve on base 1913 = 100

In order to secure evidence not open to these criticisms we have resorted to the census figures. These figures give, in five yearly periods from 1899 to 1914, the total yearly wage payments of the industries covered, together with the average number of wage earners for the same establishments. By dividing the first by the second we have found the average per capita earnings in industry as a whole and in the 14 industrial groups. These figures cover, of course, all classes of workmen, and all wage payments, whether for overtime or otherwise. They are only approximately accurate, but they should be sufficiently correct to indicate a trend. Table XV contains the amounts in dollars. In Table XVI we have converted the amounts to relative numbers and have compared them with the index of food prices to show the index of real wages. In industries as a whole, and in nearly every industrial group, the trend of real wages was downward during the 15 years. The sole exception is "Vehicles for land transportation," where the sudden growth of the automobile industry changed the character of the industrial process.

TABLE XV.—Average per capita yearly earnings of wage earners in manufacturing industries in the United States.<sup>1</sup>

| Industrial group.                                        | 1899 | 1904 | 1909 | 1914 |
|----------------------------------------------------------|------|------|------|------|
| All industries.....                                      | 426  | 477  | 518  | 579  |
| Food and kindred products.....                           | 415  | 466  | 507  | 560  |
| Textiles and their products.....                         | 335  | 363  | 412  | 449  |
| Iron and steel and their products.....                   | 521  | 553  | 618  | 681  |
| Lumber and its remanufactures.....                       | 376  | 403  | 466  | 528  |
| Leather and its finished products.....                   | 426  | 453  | 500  | 550  |
| Paper and printing.....                                  | 471  | 528  | 581  | 653  |
| Liquors and beverages.....                               | 688  | 622  | 662  | 754  |
| Chemicals and allied products.....                       | 396  | 449  | 483  | 557  |
| Stone, clay, and glass products.....                     | 444  | 549  | 553  | 612  |
| Metals and metal products other than iron and steel..... | 391  | 396  | 433  | 436  |
| Tobacco manufactures.....                                | 470  | 533  | 596  | 747  |
| Vehicles for land transportation.....                    | 552  | 691  | 643  | 691  |
| Railroad repair shops.....                               | 453  | 493  | 540  | 609  |
| Miscellaneous manufactures.....                          | 453  | 493  | 540  | 609  |

<sup>1</sup> Census figures of total wages paid for year, divided by average number of earners on fifteenth of each month throughout year. These figures are not intended to show wage earners' actual yearly incomes, but should be sufficiently accurate to establish the trend in each case.

TABLE XVI.—Trend of real wages in manufacturing industries calculated from United States census figures.

|                                           | 1899 | 1904 | 1909 | 1914 |
|-------------------------------------------|------|------|------|------|
| Food prices.....                          | 67   | 75   | 87   | 100  |
| All industries.....                       | 74   | 82   | 89   | 100  |
| Index of money wages.....                 | 110  | 109  | 102  | 100  |
| Index of real wages.....                  | 74   | 82   | 89   | 100  |
| 1. Food and kindred products.....         | 110  | 111  | 105  | 100  |
| Index of money wages.....                 | 75   | 81   | 92   | 100  |
| Index of real wages.....                  | 112  | 108  | 106  | 100  |
| 2. Textiles and their products.....       | 77   | 83   | 91   | 100  |
| Index of money wages.....                 | 115  | 111  | 105  | 100  |
| Index of real wages.....                  | 71   | 86   | 88   | 100  |
| 3. Iron and steel and their products..... | 105  | 115  | 101  | 100  |
| Index of money wages.....                 | 77   | 83   | 91   | 100  |
| Index of real wages.....                  | 115  | 111  | 105  | 100  |
| 4. Lumber and its remanufactures.....     | 77   | 83   | 91   | 100  |
| Index of money wages.....                 | 105  | 115  | 101  | 100  |
| Index of real wages.....                  | 77   | 83   | 91   | 100  |
| 5. Leather and its finished products..... | 115  | 111  | 105  | 100  |
| Index of money wages.....                 | 72   | 81   | 89   | 100  |
| Index of real wages.....                  | 107  | 108  | 102  | 100  |
| 6. Paper and printing.....                | 77   | 84   | 88   | 100  |
| Index of money wages.....                 | 115  | 112  | 101  | 100  |
| Index of real wages.....                  | 71   | 81   | 87   | 100  |
| 7. Liquors and beverages.....             | 106  | 108  | 100  | 100  |
| Index of money wages.....                 | 71   | 81   | 87   | 100  |
| Index of real wages.....                  | 106  | 108  | 100  | 100  |



TABLE XVI.—Trend of real wages in manufacturing industries calculated from United States census figures—Continued.

|                                                           | 1899 | 1904 | 1909 | 1914 |
|-----------------------------------------------------------|------|------|------|------|
| 9. Stone, clay, and glass products:                       |      |      |      |      |
| Index of money wages.....                                 | 73   | 85   | 90   | 100  |
| Index of real wages.....                                  | 109  | 113  | 103  | 100  |
| 10. Metals and metal products, other than iron and steel: |      |      |      |      |
| Index of money wages.....                                 | 80   | 87   | 92   | 100  |
| Index of real wages.....                                  | 119  | 116  | 106  | 100  |
| 11. Tobacco manufactures:                                 |      |      |      |      |
| Index of money wages.....                                 | 83   | 91   | 95   | 100  |
| Index of real wages.....                                  | 124  | 121  | 109  | 100  |
| 12. Vehicles for land transportation:                     |      |      |      |      |
| Index of money wages.....                                 | 63   | 71   | 80   | 100  |
| Index of real wages.....                                  | 94   | 95   | 92   | 100  |
| 13. Railroad repair shops:                                |      |      |      |      |
| Index of money wages.....                                 | 80   | 87   | 93   | 100  |
| Index of real wages.....                                  | 119  | 116  | 107  | 100  |
| 14. Miscellaneous industries:                             |      |      |      |      |
| Index of money wages.....                                 | 74   | 81   | 89   | 100  |
| Index of real wages.....                                  | 110  | 108  | 102  | 100  |

For machinists employed in navy yards it is possible to calculate not only wage rates but actual full-time earnings since 1914. (The rates in arsenals show approximately the same course.) Table XVII contains these results. In calculating the full-time earnings, it takes account of the overtime worked during the war and the bonus. It is assumed that part-time employment has been canceled by the 30-day vacation, and hence had a negligible effect on actual incomes. Table XVIII compares the two indices with the cost-of-living index. The index of real wage rates is fluctuating, but shows a general downward trend. The index of real full-time earnings fluctuates, of course, more widely. For the extra efforts put forth in 1917 and 1918 the machinists received a substantial increase in payment, but the trend, on the whole, is not upward.

The United States Department of Labor has recently prepared an index of hourly wages since 1840, and while, of course, the data on which it is based is even less complete than that for the more recent years, it is the best that can be compiled. This index shows that from 1840 to 1895 wages about doubled. This is undoubtedly greater than the rise in retail prices during that period, and shows that real wages actually did increase with the increase in production during the greater part of the nineteenth century. Some special influence or group of influences must have intervened about 1896 to change the situation. The table follows:

Index number of wages per hour (1913=100).

| Year.     | Index No. | Year.     | Index No. |
|-----------|-----------|-----------|-----------|
| 1840..... | 33        | 1875..... | 67        |
| 1850..... | 35        | 1880..... | 60        |
| 1860..... | 39        | 1885..... | 64        |
| 1870..... | 58        | 1890..... | 60        |
| 1895..... | 67        | 1895..... | 68        |

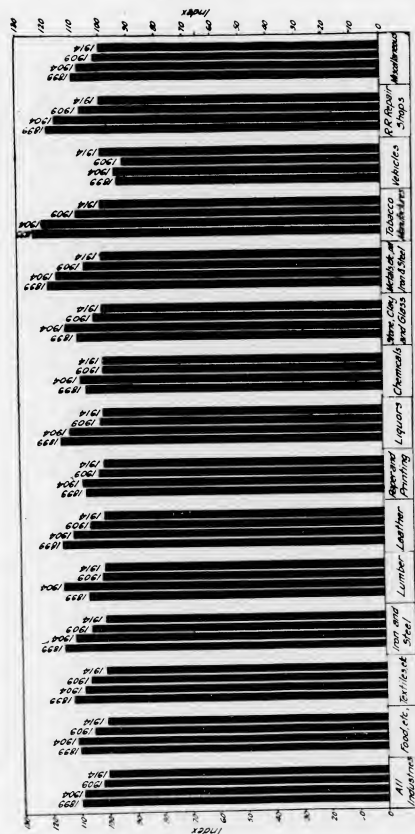
TREND OF REAL WAGES IN MANUFACTURING INDUSTRIES OF THE UNITED STATES.  
Chart No. 3.  
Data from Table XVI.



TABLE XVII.—Average wage rates and full-time earnings in navy yards, with index numbers for each, 1914-1921.

| Date.               | Wage rates. <sup>1</sup> | Index of wage rates. | Full-time earnings. <sup>2</sup> | Index of full-time. | Remarks.         |
|---------------------|--------------------------|----------------------|----------------------------------|---------------------|------------------|
| 1914.....           | 3.76                     | 100.0                | 3.76                             | 100.0               | 8-hour day.      |
| Jan. 1, 1915.....   | 3.76                     | 100.0                | 3.76                             | 100.0               | Do.              |
| Jan. 1, 1916.....   | 4.08                     | 107.9                | 4.08                             | 107.9               | Do.              |
| Jan. 1, 1917.....   | 4.37                     | 115.9                | 4.37                             | 115.6               | Do.              |
| May 1, 1917.....    | 4.37                     | 115.6                | 6.00                             | 158.7               | 10-hour day.     |
| Nov. 1, 1917.....   | 4.75                     | 125.7                | 6.53                             | 172.7               | Do.              |
| May 1, 1918.....    | 5.77                     | 152.0                | 7.93                             | 209.8               | Do.              |
| Nov. 1, 1918.....   | 6.40                     | 169.3                | 6.40                             | 169.3               | 8-hour day.      |
| July 1, 1920.....   | 6.41                     | 169.3                | 7.16                             | 189.4               | Bonus added.     |
| Sept. 16, 1920..... | 6.72                     | 177.7                | 7.48                             | 197.9               | Do.              |
| July 1, 1921.....   | 6.72                     | 177.7                | 6.72                             | 177.7               | Bonus withdrawn. |

<sup>1</sup> Arithmetic average of maximum rates in the several yards sufficient for purposes of the index, since differentials between maximum and other rates were nearly constant. Machinists in some yards have received slightly greater advances in others, slightly smaller ones.

<sup>2</sup> Takes into account overtime worked during the war at time and one-half rates, and the congressional bonus.

TABLE XVIII.—Real wages and real earnings of machinists in navy yards.

| Year.               | Index of wage rates. <sup>1</sup> | Index of full-time earnings. <sup>2</sup> | Index of cost of living. <sup>3</sup> | Index of real wages. | Index of real earnings. |
|---------------------|-----------------------------------|-------------------------------------------|---------------------------------------|----------------------|-------------------------|
| 1914.....           | 100.0                             | 100.0                                     | 100.0                                 | 100                  | 100                     |
| Jan. 1, 1915.....   | 100.0                             | 100.0                                     | 100.0                                 | 97                   | 97                      |
| Jan. 1, 1916.....   | 107.9                             | 107.9                                     | 105.1                                 | 103                  | 103                     |
| Jan. 1, 1917.....   | 115.6                             | 115.6                                     | 118.3                                 | 98                   | 98                      |
| May 1, 1917.....    | 115.6                             | 158.7                                     | 128.7                                 | 90                   | 123                     |
| Nov. 1, 1917.....   | 125.7                             | 172.7                                     | 134.2                                 | 88                   | 121                     |
| May 1, 1918.....    | 152.0                             | 209.8                                     | 134.9                                 | 99                   | 153                     |
| Nov. 1, 1918.....   | 169.3                             | 169.3                                     | 174.4                                 | 97                   | 97                      |
| July 1, 1920.....   | 169.3                             | 189.4                                     | 216.5                                 | 78                   | 87                      |
| Sept. 16, 1920..... | 177.7                             | 197.9                                     | 208.5                                 | 85                   | 95                      |
| July 1, 1921.....   | 177.7                             | 177.7                                     | 180.4                                 | 98                   | 98                      |

<sup>1</sup> From Table XVII.

<sup>2</sup> From United States Bureau of Labor Statistics Index. Where the wage adjustment is in January or November, the December figure is taken, where in July, the June figure. The figures for May, 1917, May, 1918, and September, 1920, are the result of interpolation.

As a result of these studies of real wages we may derive a startling conclusion. From 1840 to 1896 the purchasing power of wages did rise with some relation to the increase in production. But since 1896 it not only failed to keep pace with this increase, but registered an absolute fall. According to Day's index of production, if real wages had increased in direct ratio to the increase in per capita production since 1869, they would in 1918 have been about 30 per cent above the 1896 figure. But according to Douglas's index of real wages, they were actually in 1918 about 30 per cent below the 1896 figure. This means that if the average wage earner in 1918 had received the same share of the physical production of the Nation which he received in 1896, the average wage in 1918 would have been 85 per cent higher than it was.

2. *Retention of real wages to prices.*—This study of real wages brings to the surface an apparent contradiction. We began by proving that wages did increase since 1896 as the value-product of industry increased. We now see that wages, measured by their purchasing power, have actually declined since 1896 so that the wage-earners are not only unable to absorb their former share of the total national product, but can not even absorb as many physical goods as they could in 1896, before the recent increases in productivity took place. How is this contradiction to be explained?

It is not to be explained on the ground that the employers, as such, have absorbed a larger share of the product. For the "Value added by manufacture" to which we found wages had a constant ratio, includes everything paid out in interest, rent, profits, and salaries on the manufacturing process itself. Wages,

measured in terms of prices at the factory, apparently have not declined. It is wages measured in terms of retail prices that have gone down. Evidently, then, the discrepancy is to be accounted for by a rapidly increasing margin between manufacturers' prices and retail prices.

This increase must have been not merely proportional to the general increase in manufacturers' prices, but much greater. Suppose an article sells at the factory for \$10 and the retailer sells it for \$20 and there is therefore a margin of \$10. Suppose then prices double all around; the factory price becomes \$20, the retailer's price \$40, and the margin \$20. Such a change would not affect the purchasing power of wages at all, if they retained the same ratio as before to factory prices. For in that case wages would double also, and wage earners could afford to pay \$40 at the store for an article which formerly cost \$20. The persons engaged in the distributing process between manufacturer and retailer would be performing the same service as before, and would be receiving the same relative compensation for that service.

What must have taken place since 1896, if our theory is correct, is an advance of retail prices in a more rapid ratio than the advance of factory prices. The persons engaged in the distributive processes—the shippers, warehousemen, commission men, speculators, wholesalers, traders, advertising agencies, sales agencies, retailers, etc., have been receiving a larger relative share of the national product. They have been exacting a higher return in goods for every dollar of steel and yard of cloth produced. They have not only absorbed the wage-earner's share of the increased production of the nation, but more, too. This may not mean that the average middleman has been receiving a higher relative income. It may mean, instead, that the distributive process has become more complex and engages a larger proportion of the population; but it does mean, at any rate, that while manufacturing industry has been increasing its efficiency, distributive service has suffered a loss in efficiency of sufficient magnitude to eat up more than the saving made in manufacture.

It is difficult to check up this increasing margin between factory and retail prices, since we seem to lack any index of retail prices of an article which can be compared with an index of factory prices of the same article. If, however, we take the period between 1890 and 1914—the same census period we used in studying the distribution of the value production of industry—we find that retail prices of food increased from 68 to 102 (on the basis of 1913=100), while wholesale prices of food went up merely from 75 to 103. We have no good index of retail prices except that for food.

If we are right in assuming that the index of retail food is approximately the same as that of retail prices in general, the increasing margin between retail and wholesale prices is far more marked in many manufactured articles. Wholesale prices of cloths and clothing, for instance, went up from 1890 to 1914 merely from 82 to 98; metals and metal products, which fluctuate widely, actually dropped from 108 to 87; and chemicals and drugs moved only from 96 to 101.

For purposes of this comparison a new series of indices would have to be constructed, but what evidence we have points strongly in the direction of the truth of our theory.

## APPENDIX A.

## QUOTATIONS FROM ECONOMIC AUTHORITIES ON THE THEORY OF WAGES.

1. The quotations given below support the production theory of wages and emphasize one or another detail of it.

[From *Distribution of Wealth*, by John Bates Clark.]

"The amount that workmen can generally, by any shrewdness or firmness, exact from employers is limited, as we shall show, by the productive power that resides in labor; and the forces that control the prevailing terms of wage contracts are those which determine the amount of that productive power" (p. 2).

"We may now advance the more general thesis—later to be proved—that, where natural laws have their way, the share of income that attaches to any productive function is gained by the agent by the actual product of it. In other words, free competition tends to give to labor what labor creates, to capitalists what capital creates, and to entrepreneurs what the coordinating function creates" (p. 3).

"In case it shall prove to be true that products and shares do thus coincide, we need further to know whether each of these separate incomes grows absolutely smaller or larger. We must ascertain whether evolution makes labor more productive, and therefore better paid, or less productive, and therefore worse paid" (p. 4).

"The specific productivity of labor fixes wages—this is the thesis that is to be supported in this volume. Ascertain how large a product is to be attributed to a single unit of labor that is employed in raising wheat, making shoes, smelting iron, spinning cotton, etc., and you have the standard to which the pay of all labor tends to conform" (p. 47).

"What we have claimed is that, in modern life as well as in primitive life, the identity of wages with the product of labor is, in a general and approximate way, maintained, and that this product furnishes the standard about which wages for short periods fluctuate" (p. 92).

"These incomes (wages and rent) are fixed by the final productivity of labor and capital, as permanent agents of production" (p. 100).

"The kind of dynamic change that is most useful for the illustration of this point is brought about by an improvement in the methods of production. Thus, an invention makes it possible to produce something more cheaply. It first gives a profit to entrepreneurs, and then, in the way that we have described, adds something to wages and interest. This is equivalent to a creation of new wealth. It has made a definite addition to the income of society, and from the movement when the improved method has been put into operation the static standard of wages has been higher. The rate toward which the pay of labor is now tending is not what it was before the invention was applied, but it is a new and higher rate. Wages now tend to equal what labor can now produce, and this is more than it could formerly produce. When the full fruits of this invention should have diffused themselves through society the earnings of labor will equal the new standard rate.

"Let another invention be made that also effects an economy in production. It also creates a profit—At the moment when the second invention is applied, then, there is a new and still higher standard established for actual wages; and they will pursue the standard till they reach it, though before they do so a still remoter and higher standard will be before them" (p. 405).

"If, instead of occurring at intervals considerably separated, the improvements in industrial methods were continually taking place; if one followed another so closely that when the second occurred the fruits of the first were only beginning to make their impressions on the earnings of labor, then, as a result, we should have the standard of wages moving continuously upward and actual wages steadily pursuing the standard rate in its upward movement, but always remaining by a certain interval behind it" (p. 406).

[From *The Modern Distributive Process*, by Clark and Giddings.]

"The wages-fund doctrine has been fully overthrown, and it has been abundantly demonstrated that the actual rate of wages is made by the productiveness of industry; but the proposition has not been reduced to perfect definiteness. That is to say, it is no longer disputed that wages are more when the product is more and less when the product is less, but there is still dispute whether increasing production tends to benefit chiefly the employer or chiefly the laborer. The decisive answer to this question will be given some day by statistics" (*The Natural Rate of Wages*, by F. H. Giddings, p. 60).

[From *Dynamics of the Wages Question*, by John Bates Clark. Publications of the American Economic Association, third series, vol. 4, pp. 130-143.]

"Workmen are creating daily certain amounts of wealth; and if the changes and disturbances that social progress implies should cease and if certain causes of friction were removed, every man would get, as his pay, the amount that he really produces. Ten years hence the men will work in a different manner and with different appliances, and if we could then stop the influences of change and let competition again do its full work, we should find men getting amounts that would correspond to their changed powers of production."

"The marginal productive power of labor furnishes the standard of wages, and, in general, this is tending upward, and the actual rate is pursuing it—In a dynamic view, the condition is natural if the upward movement of the

standard goes on at a normal rate, and if the actual wages lag behind it by a normal interval" (p. 130).

[From *Outlines of a Theory of Wages*, by F. W. Taussig.]

"Clearly there is a relation between wages on the one hand and product or efficiency on the other. It is this relation, for example, which explains the great international variations of wages. If the return to labor is higher in the United States than in England or Germany, higher in these than in Italy or Russia, the differences are due mainly to the greater or less productiveness of labor in the several countries" (p. 1).

"All the standards of living in the world will not make wages high, if laborers are many, and if their product (their marginal discounted product) is small" (p. 19).

[From *Laws of Wages*, by Henry L. Moore.]

"We shall approach the very kernel of the productivity theory by successive stages. Three essential propositions in the theory will be established. It will be demonstrated, first, that in a particular industry, in which labor plays a relatively large role in production, the fluctuation in the rate of general wages varies directly with the fluctuation in the value of the product per laborer. It will then be established that the fluctuation in the laborer's relative share in the value of the product varies directly with the fluctuation in the amount of machine power per laborer employed in the industry. In the third place, a proof in a particular instance will be supplied of an important dynamic corollary of the productivity theory of wages, namely, that other conditions remaining the same the general trend of the laborer's share of the product is determined by the ratio in which capital and labor are combined in production. These three investigations will bring to a statistical test the essential propositions in the productivity theory; the rate of general wages will be related to the productivity of labor, and the secular trend of the laborer's share in distribution will be brought into functional dependence upon the ratios in which capital and labor cooperate in production" (pp. 44-45).

[From *The Theory of Wages*, by Herbert M. Thompson. Published 1892, Macmillan Co.]

"Labor is neither limited for its reward to a wage fund nor is it entitled to the residuum of a varying product of industry. Wages (like rent, interest, and Entrepreneur's profits) are a varying proportion of a varying product of industry" (p. 81).

[From *Distribution of Wealth*, by T. M. Carver.]

"His work consists in taking a piece of material which is worth little and putting it into a shape in which it is worth more. The amount of value which he adds to it is the amount which he, together with his tools, earns. Subtract from this amount the cost of keeping himself supplied with tools, and you have the wages of his labor" (p. 142).

"In this case the rule is that a rate of wages will be paid which will be approximately equal to the marginal product of labor" (p. 154).

"All this is equivalent to saying that each individual laborer gets as wages approximately the equivalent of the amount which he individually can add to the product of the group to which he belongs, or of the amount which he can subtract from the product of the group by withdrawing himself" (p. 157).

"This law is that a given unit of labor of any kind is valued in industry according to the amount which it can add to the total product of the industry, or the amount which can be produced with this unit over and above what can be produced without it" (p. 164).

"The marginal productivity of any class determines the rate of wages of that class" (p. 181).

[From *Principles of Economics*, by Fetter.]

"The law of wages may be stated thus: In any state of the labor market the wages of any laborer or class of labor is equal to its marginal contribution—that is, to the value of its product" (p. 213).

[From *Introduction to Economics*, by Mr. H. H. Saegeer.]

"The thesis that we have proposed to defend is that under conditions of free, all-sided competition the earnings of marginal, as of other, workmen will correspond accurately to the contributions which they make to production" (p. 243).

[From Principles of Economics, by Seligman.]

"Wages depend on marginal productivity." (p. 417).

"The normal rate of wages, that is, the amount to which wages tend to conform under conditions of free competition and mobility of both capital and labor, is the amount of value which a given increment of labor produces at the margin" (p. 418).

[From A History and Criticism of the Various Theories of Wages, by W. D. McConnell.]

"It is a striking tribute to the substantial truth of the theory according to which wages depend on the efficiency of work, together with the intensity of the demand on the part of the capitalists for the aid of labor, that of the theories which I have noticed on the preceding pages, all, with the exception of the theories of Professor Rogers and Karl Marx, recognized a connection more or less intricate, between the efficiency of work and the amount of wages" (p. 68).

[From The Wages Question, by Francis A. Walker.]

"On the contrary, I hold that wages are, in philosophical view of the subject, paid out of the product of present industry; and hence that production furnishes the true measure of wages" (p. 128).

"We repeat, the employer purchases labor with a view to the product of the labor; and the kind and amount of that product determine what wages he can afford to pay. \* \* \* It is then for the sake of future production that the laborers are employed, not at all because the employer has possession of a food which he must disburse, and it is the value of the product, such as it is likely to prove, which determines the amount of the wages that can be paid, not at all the amount of wealth which the employer has in possession or can command. Thus it is production, not capital, which furnishes the motive for employment and the measure of wages" (p. 129).

[From Principles of Economics, by F. W. Taussig.]

"Similarly, the marginal contribution from any grade or group of labor determines the remuneration of all within that grade" (p. 451).

"Very different in character from the confused and fallacious notions just discussed is the view, held by many able economists of our day, that the fundamental determinant of wages is the specific product of labor. \* \* \* Each (capital and labor) tends, under competitive conditions, to get as a reward what it adds to the product" (p. 197).

"The simplest and clearest mode of stating the theory of general wages is, in my judgment, to say that wages are determined by the discounted marginal product of labor" (p. 198).

[From Capital, War, and Wages, by W. H. Mallock.]

"The fact in question is that, if the incomes of the population generally are to be raised in the future to any substantial extent, this result can not be achieved by any mere redistribution of income already existing, but must be looked for in a large increase of the total amount produced" (p. 44).

2. The following quotations emphasize the fact that under present conditions, collective wage bargaining is necessary to secure for the worker the share he may reasonably expect of the product of industry.

[From Introduction to Economics, by H. R. Seager.]

"The wages contract is a bargain, and when it fails to secure for labor its competitive share of the product the cause must be sought in the unequal bargaining ability of workmen and their employers. The principal disadvantages under which workmen are placed are: First, that their labor resembles a perishable commodity in that it must be sold each day if they are not to incur loss. This circumstance forces them at times to accept wages that are below their normal earning capacity, but less often than many writers represent."

\* \* \* A second disadvantage results from superior knowledge which employers usually have of conditions that influence the wages contract \* \* \* A third disadvantage results from the actual or tacit understandings which often restrain employers from competing freely for employees by advancing

wages. There is a strong reluctance on the part of employers 'to spoil the labor market' and even when they are not combined in employers' associations, as often happens, this serves to make them conservative in reference to wages" (p. 385).

"The tendency of the above disadvantages is to render workmen inferior to employers as bargainers and to cause them to accept less than their fair share of the products they help to produce" (p. 386).

"On the other hand, if they—trade unions—follow their own interest intelligently they can secure not only for their members, but for all the workmen in the trade, the full competitive rate of wages. Representative employers can afford to pay this and will do so if their ability in bargaining is matched on the other side. The services the unions perform in securing this result may be summarized under the following heads: (1) They are organized to resist unfair terms and to cause loss to the employer who attempts to cut wages below the fair competitive rate; (2) they keep workmen informed as to the rates that are actually paid, and in this way protect them from making bad bargains through ignorance; (3) they inform themselves in regard to general market conditions and force employers to advance wages when conditions are favorable more promptly than they would without such coercion" (p. 405).

[From Principles of Economics, by Taussig.]

"It is certain and indeed obvious that the bargaining power of hired workmen is strengthened by their acting in a body" (p. 263).

"Labor organizations are thus effective toward securing 'fair wages'; that is, the current or market rates determined under the conditions of employment. They aid in enabling the laborers to get in each particular case the wages determined by the full competitive demand for the special sort of service, and they aid in bringing the general rate of wages to the full discounted value of the product of labor in general. Under the régime of private property and competitive industry this is doubtless all that unionism can achieve in raising wages. But it is a great deal. The current or fair rate of wages is not determined automatically or with any accurate denunciation. It is always the result of bargaining. There is always a debatable ground and a chance for maneuvering by both parties" (p. 265).

[From Principles of Economics, by Seligman.]

"The recognition that is to-day almost universally accorded them—labor organizations—rests on the economic principle that in the modern labor contract the conditions of work have become collective or group bargaining, and that the bargaining to be equal must be collective or group bargaining. The individual workman is now helpless against the typical employer" (p. 434).

[From History and Problems of Organized Labor, by F. T. Carlton.]

"The maximum amount which an employer can afford to pay an employee is the equivalent of the increased productivity of the plant because of the employer's effort. But the productivity of the employee depends not merely upon his skill and efficiency, but also upon the manner in which his labor is directed and correlated with that of others. The upper limit may also be raised by using improved machinery by utilizing by-products and eliminating wastes and by securing law and order and the safety of investments. Unwise action on the part of labor organizations may tend to lower the upper limit. Frequent resort to strikes, undue restriction of output, successful resistance to the introduction of machinery or new processes of performing work, and opposition to the training of apprentices will sooner or later lower the upper wage limit or retard its upward movement. The lower wage limit is the absolute minimum necessary to prevent the physical, mental, and moral deterioration of the workers. It depends, as a rule, upon the standard of living required of the particular trade at that particular time and in that particular locality. The skilled worker usually has a higher standard of living than the unskilled worker, and the lower wage limit of the latter than in the case of the former."

"Within these two limits the actual wage received will be fixed. The exact rate depends upon a variety of circumstances, such as the bargaining ability

of the workers and the monopoly power of the employer. The bargaining power of the isolated worker is slight. His knowledge of the labor market and the urgency of the need of the employer is slight; and his own need of employment is frequently urgent. Again, the manual worker is by reason of his occupation inexperienced in bargaining. The individual bargain is usually inefficient and unstandardized. Collective bargaining, or the bargaining of employees as a group, removes many of the disadvantages which militate against the individual wage earner, and it tends to standardize the conditions of employment—hours, speed, time, and methods of payment and the like. Through strong unions and well-organized systems of collective bargaining wages may be increased; but it is not within the power of wage workers using the purely economic methods of unionism to eliminate differential rents and many forms of monopoly gains" (p. 5.)

[From Essentials of Economic Theory, by John Bates Clark.]

"Organization means collective bargaining and tends to equalize the strategic positions of men and employers. When an entire force of workers must be dealt with at one time the employer has not the alternative ready to his hand which he would have if he had only to employ a single one. \* \* \* Without organization and by means of individual bargaining, wages are drawn downward toward the level set by what idle men will accept, which may be less than they will produce after they receive employment and will surely be less than they produce after they have developed their full efficiency. With organization which is local only, and with collective bargaining that goes only to the extent of adjusting the pay of men in one establishment, this pay comes nearer to the standard set by the productivity of labor than it would if the bargains were individually made" (p. 433).

"Under all three of the conditions just described the static standard of wages—the final productivity of social labor—still exists; and the actual pay of labor tends toward it, but differs from it by varying amounts, according as labor is unorganized, locally organized, or organized throughout a sub-group" (p. 454).

[From Principles of Labor Legislation, by Commons and Andrews.]

"It is apparent that the individual laborer is at a great disadvantage in bargaining with an employer. The employer is often a great corporation, which is itself a combination of capital. But the disadvantage of the laborer is even more fundamental. Being propertyless, he has no opportunity to make his living, but to work on the property of others. Having no resources to fall back upon he can not wait until he can drive the most favorable bargain. It is a case of the necessities of the laborer pitted against the resources of the employer. It is only when labor bargains collectively that its bargaining power approximates equality with that of capital" (p. 116).

[From Organized Labor, by John Mitchell.]

"In its fundamental principle trade unionism is plain and clear and simple. Trade unionism starts from the recognition of the fact that under normal conditions the individual, unorganized workman can not bargain advantageously with the employer for the sale of his labor. Since the workman has no money in reserve and must sell his labor immediately; since, moreover, he has no knowledge of the market and no skill in bargaining; since, finally, he has only his own labor to sell, while the employer engages hundreds of thousands of men and can easily do without the services of any particular individual, the workman, if bargaining on his own account and for himself alone, is at an enormous disadvantage. \* \* \* The 'individual bargain' or individual contract between employers and men means that the condition of the worst and lowest man in the industry will be that which the best man must accept" (p. 3).

"To find a substitute for the individual bargain, which destroys the welfare and happiness of the whole working class, trade unions were founded. \* \* \* The fundamental reason for the existence of the trade union is that by it and through it workmen are enabled to deal collectively with their employers" (p. 4).

[From Principles of Economics, by A. Marshall, vol. 1, 5th ed.]

"If the employers in any trade act together and so do the employed, the solution of the problem of wages becomes indeterminate; and there is nothing but bargaining to decide the exact shares in which the excess of its incomes over its outgoings for the time should be divided between employers and employed. Leaving out of account industries which are being superseded, no industry of wages will be permanently in the interest of employers, which lowering of wages will be to other workers, or even to other industries in which they abandon the special earnings of skill; and wages must be high enough in an average year to attract young people to the trade. This sets lower limits to wages and upper limits are set by corresponding necessities as to the supply of capital and business power. But what point between these two limits should be taken at any one time can be decided only by higgling and bargaining; which are, however, likely to be tempered somewhat by ethics, prudential considerations, especially if there be a good court of conciliation in the trade" (p. 627).

[From Trade Unionism in the United States, by F. R. Hoxie.]

"The tendency is for wages and conditions to sink to the level which could be secured through the competitive strength of the weakest worker in the group. The only way to prevent this deterioration is to rule out all competition between the individual workers of the group, both in the making of the bargain with the employer and in the subsequent interpretation of it and work under it.

"This can be done only by the establishment and maintenance of two principles; the principle of uniformity in regard to all the conditions of work and pay where competition direct or indirect can take place between individual workers, and the principle of standardization, or restrictive regulation by the group, of all changes in conditions of work and pay during the term of the wage contract. These principles can be established and maintained only through collective bargaining, and this is its principal function" (p. 256).

[From Labor Problems, by Adams and Sumner.]

"A portion of the product of industry may go either to the employer as profits or to the wage earner as wages; what the one gets the other loses; in the division of this portion of the product the two classes are necessarily rivals; and while the wage system endures no amount of repetition about "harmony" and "cooperation" can ever disguise or eliminate this immediate individual antagonism.

"The two antagonists, then, must fight it out; the important question is—how shall the fight be conducted. Evidently it may be fought out by the violent means of strikes and boycotts or in the judicial fashion of a lawsuit; or by the commercial method of higgling over terms and prices, which Mr. Mundell has called a 'long law' and Mrs. Webb 'collective bargaining.' It is the last method with which we are concerned here. Collective bargaining, of course, takes place as soon as organized labor can persuade or compel an employer to deal with his employees collectively or by common rules" (pp. 301-302).

[From Shall Free Collective Bargaining be Maintained, by Carl H. Mote, Am. Ac. of Pol. Soc. Science.]

"This theory appears feasible enough until we remember that capital's wanted policy is to pay out in wages precisely what is demanded to maintain production at a given rate, and no more; or that labor's wanted policy is to collect the greatest wage obtainable for a given service. It is because of the conflict that arises at this point of difference that employees organize to do collectively what experience has proven they can not do individually. It is because of this point of difference that collective bargaining has become an established fact in many industries" (p. 215).

"So far as the influence of collective bargaining is concerned as a factor for enlightened citizenship, for obtaining comfortable wages and sufficient leisure for recreation, it stands paramount in the field of industry" (p. 219).

[From Industrial Democracy, by Sidney and Beatrice Webb.]

"We thus see that it is not only economically permissible, but in the view of our best authorities necessary for self-protection, that the workmen should not simply acquiesce in whatever conditions the employer may propose, but that they should take deliberate steps to protect themselves by 'higgling and bargaining.' If they are not to suffer lower wages and worse conditions of employment than there is any economic necessity for. \* \* \* And if the workmen ask how they can strengthen themselves in this higgling and bargaining, how they are most effectively to pursue their own interest, the answer of abstract economics is combination" (p. 649).

"Finally, whilst the bulwark of a standard of life is always yielding under the pressure of severe competition, it does not get systematically built up again in seasons when the pressure is lightened. To the capitalist the scanty profits of lean years are made up by largely swollen gains in the alternating periods of commercial prosperity. But a wage determined only by an instinctive standard of life does not rise merely because the employers are temporarily making larger profits. The 'habits and customs' of a people—their idea of what is necessary for comfort and social decency—may in the slow course of generations of prosperity slowly and imperceptibly change for the better, but they are unaffected by the swift and spasmodic fluctuations which characterize modern industry. Thus in the years of good trade, when no competent man need remain long unemployed, though the pushing workman may, without a trade union, temporarily exact better terms, the class as a whole is apt to get only regular employment as its accustomed livelihood. In the absence of mutual consultation and concerted action, individuals may aspire to a higher standard, but there can be no simultaneous and identical rise and thus no consensus of feeling is brought to the aid of individual bargaining of the weaker men.

"Trade unionism, to put it briefly, remedies all these defects of a merely instinctive standard of life. By interpreting the standard into precise and uniform conditions of employment it gives every member of the combination a definite and identical minimum to stand out for, and an exact measure by which to test any new proposition of the employer" (p. 700).

"\* \* \* The method of collective bargaining brings a new kind of support. When the terms of the contract are settled, not separately by the individual workmen concerned but jointly by appointed agents on their behalf, an additional barrier is interposed between the pressure acting through the employer and the apprehensions and ignorance of his wage earners. The conclusion of collective agreements not only excludes, as we have explained, the influence of the exigencies of particular workmen, particular firms, or particular districts, but it also gives the combined manual workers the invaluable assistance of a professional expert who, in knowledge of trade and trade capacity for bargaining, may be even superior to the employer himself. The method of collective bargaining has the further advantage over reliance on a merely instinctive standard of life that the terms can be quickly raised so as to take advantage of any time of raising of profits, and indefinitely adjusted so as to meet the requirements of an ever-changing industry" (p. 701).

[From Wages, by Francis A. Walker.]

"\* \* \* In a state of imperfect competition, the employer is not the laborer's guardian or the trustee of his earnings. \* \* \* The reasoning to the contrary, on the assumption of a vital harmony of interests, can not fail to remind one of the economical plea, with which it is joint by John Idealist, once so widely urged, that the owner's interest would abundantly protect the slave against physical abuse and privation. \* \* \* after all, there is only one way in which the rights of any body of men can be secured, and that is by being placed in their own keeping" (pp. 241-2).

"But that portion of his treatise on which I should be disposed most strongly to insist, as of extended consequence in the philosophy of wages, is the doctrine that if the wage laborer does not pursue his interest he loses his interest in opposition to the view so generally maintained by economists, that if the wage laborer does not seek his interest will seek him; that economic forces are continually operating to relieve and repair the injuries of labor; and, specifically, that all sums taken in excessive profits, or for the

excessive remuneration of capital, whether through combinations of employers or capitalists or through the disability of the working class, are sure to be restored to wages" (p. 411).

[From Outlines of Economics, by Ely.]

"The question is often asked why 'labor organizations are necessary, in view of the fact that wages are fixed, at least within broad limits, by deep-seated economic and social forces which the labor organizations can not effectively control.

"The answer is in part that economic laws work themselves out through men and through organizations—they are not self-enforcing.

"Even if we grant that labor is in essentials a commodity whose price is fixed by demand and supply, there is still a reason for the labor organization. The supply of labor is largely controlled, in the long run, as we have seen, by the standard of life. If a great horde of unorganized and unsympathetic wage earners are continually bidding against one another in the labor market, each individual endeavoring to get a little more work by offering to take a little less pay, the standard of living will be subtly undermined—'nibbled away,' as a well-known writer has expressed it. The labor organization, by repressing the vicious activity of this competition, by compelling its members to offer the same terms and abide by common or standard rules, bulwarks the standard of life and gives it increased precision, increased power, and durability" (p. 445).

#### APPENDIX B.

##### REPLIES OF AMERICAN ECONOMISTS TO QUESTIONNAIRE ON WAGES, PRODUCTION, AND COLLECTIVE BARGAINING.

In an effort to elicit the present opinion of the foremost American economic authorities on the general subject of the relation between wages and production on the one hand and collective bargaining on the other, the Labor Bureau sent a questionnaire to a list of 40 leading economists in the country. Twenty answers have so far been received, and the tabulated results, together with the original answers, follow.

It was understood that the questions, since they were necessarily brief and of a general nature, were open to a number of varying interpretations in detail, and that the answers to them would be in many cases expressions of opinion rather than of scientifically ascertained fact. Nevertheless, the result furnishes a significant and authoritative support of a number of our contentions.

The questions were as follows:

1. (a) Do real wages increase as the physical production or income of the Nation increases?

1. (b) Should they so increase?

2. (a) Would it be desirable to establish a definite relation between wages and production?

2. (b) Would the operation of demand and supply in an open labor market be sufficient, under modern conditions, to secure to the wageworker his full share of the product?

2. (c) Can the wageworker be more certain of securing their full share of the product by the use of collective bargaining than without it?

These questions were framed in view of the fact that many authorities hold to the production theory of wages. It was believed that the answers would show a preponderance of opinion to the effect that there is a tendency for wages to increase as production increases, that this tendency is sound economically and is to be approved, and that if it fails to operate for any reason measures to render its operation more certain are to be indorsed. Specifically, the questionnaire sought to bring out the opinion that wage earners would not receive their "full competitive share" of the product without collective bargaining, under modern industrial conditions, where combinations of capital and employers limit competition.

#### ANALYSIS OF REPLIES.

1. (a) Do real wages increase as the physical production or income of the Nation increases?—Fifteen economists were of the opinion that real wages do show a tendency to increase as production increases, although they were not

unanimous that the increase actually and invariably takes place. Four were doubtful. None answered with a direct negative.

1. (b) *Should they so increase?*—It is significant that the 18 who answered this question were unanimous in the affirmative. A few of the production theorists qualified their answer by the proviso that the increase should arise from the increased efficiency of labor. On the other hand, a few others favored an increase in real wages whether production increases or not. The answer to this question gives authoritative support to the general principle elaborated in our report.

1 (c). *Would it be desirable to establish a definite relation between wages and production?*—This question, without precise definition of the proposed means to be employed, was open to numerous interpretations, and the uncertainty is reflected in the answers. Eight replied in the affirmative, four in the negative, and six were doubtful, their doubts having to do largely not with the general desirability but with the specific possibility of establishing a definite relation between wages and production.

2 (a). *Would the operation of demand and supply in an open labor market be sufficient, under modern conditions, to secure to the wageworker his full share of the product?*—This question was intended to bring out the fact that "economic laws" would not operate automatically to give workers their fair share of the product under conditions where full competition between employers does not prevail. If one answered question 2 (b) by "yes," he would logically answer this one by "no." Unfortunately, a few of the economists seemed to misunderstand the question, and in one or two cases where this was obvious we have counted the answer as "no" rather than "yes." Four answered in the affirmative; 14 felt that workers can not, under modern conditions, secure their full competitive share of the product without collective bargaining; and one was doubtful.

2 (b). *Can the wageworkers be more certain of securing their full share of the product by the use of collective bargaining than without it?*—On the value of collective bargaining the economists were almost unanimous, 19 answering in the affirmative and only 1 in the negative. This bears out our report in two main points, as follows:

(1) In our contention that the share of the product which has in the past been received by labor represents a minimum, not being in many cases the result of collective bargaining.

(2) In our contention that Federal employees, not being able to exercise collective economic pressure, should not be forced to depend on chance rates in neighboring plants but should be remunerated on a more scientific principle.

The various answers follow in detail.

Prof. T. S. Adams (Yale College, New Haven, Conn.):

1 (a). "This question is too general. They might and have at different periods increased more or less rapidly than physical production. And do you mean per capita production, and what account is to be taken of increased capital and capital equipment? The question is too general."

(b). "It is desirable that real wages should increase whether physical production increases or not. Per contra a given increase in a particular industry may be so clearly due to invention or increased capital or better enterprising that 'wages' could lay no claim to the increase as 'earned.'"

(c). "No. Not until wages and the other factors of production become frozen into fixed relationships, i. e., never."

2 (a). "No; not with labor monopolized."

(b). "Yes."

Prof. E. L. Bogart (University of Illinois, Urbana, Ill.):

1 (a). "Yes; since real wages are the distributive share of the national income. If the national income increases, and no change occurs in methods of distribution, real wages increase pari passu."

(b). "Yes."

(c). "No. In a dynamic society it might happen that larger rewards would need to be paid to one or another of the other factors of production rather than to labor in order to stimulate production."

2 (a). "Yes. The answer to this depends upon the theory of wages which one holds, but according to the marginal productivity theory of wages this would be true."

(b). "It seems to me that the history of labor shows that more can be secured for labor through collective bargaining than without it."

Prof. T. N. Carver (Harvard University, Cambridge, Mass.):

1 (a). "Not necessarily for any special class of laborers. For all laborers, receivers of salaries as well as of wages; yes."

(b). "Yes; for all laborers, not necessarily for any particular class of laborers."

(c). "Yes."

2 (a). "Yes."

(b). "No; though some of them might, for a time, get more than their actual product."

Prof. John Bates Clark (Columbia University, New York):

1 (a). "Yes; unless there is something unusual and abnormal in the distribution of the general income. General physical production of an entire economic society means general income."

(b). "Yes."

(c). "It is essential that wages should closely correspond to the part of production attributable to labor. See my 'Distribution of Wealth' and also 'Essentials of Economic Theory.'"

2 (a). "If by 'modern conditions' a state is indicated in which there are numerous quasi monopolies, worker's share in distribution would not accurately correspond to his contribution to production."

(b). "Yes."

Prof. John M. Clark (University of Chicago):

1 (a). "Yes; but they do not necessarily increase in any given trade as the physical output in that trade increases. They are extremely likely to, however. Conversely, they can not increase in general, to any considerable extent, without increase in physical output, unless some fairly revolutionary change can be made by which rent and capital income would be absorbed without material damage to productive efficiency or to the adequacy of the future supply of capital. Not inconceivable, but not easy."

(b). "Yes; if possible, especially where increased output due to efforts of labor. Subject is complicated by desirability of making minimum wage for labor a fixed charge on industry even if labor not fully employed, thereby stimulating employers to take steps toward diminishing irregularity of employment."

(c). "Not any simple ironclad formula. Desirable that, in long run, labor should share full benefit of increased efficiency; while, in short run, gain should be shared between labor and employers to give both incentive to increase output."

2 (a). "If 'open labor market' means competition of individual laborers without collective bargaining, emphatically no."

(b). "Yes."

Prof. John R. Commons (University of Wisconsin, Madison):

1 (a). "Yes; but in different amounts according to pulling power."

(b). "Yes."

(c). "Can not be done generally; only by comparison of one class of labor with another."

2 (a). "No."

(b). "Yes."

Prof. Ira B. Cross (University of California, Berkeley):

1 (a). "Don't know. They may or they may not. Depends upon whether prices are high or low, and also on the level of wages."

(b). "Certainly; but the answer does not commit me to any sort of productivity theory of wages."

(c). "No. I can see no reason why any attempt should be made to establish such a relation. Even though established, there would be great difficulty involved in connection with the administration of the scheme. Production to the employer means really dollars and cents production, not units of product. A small unit production per man might mean a large value production per man. Value of product might vary greatly, while unit production might remain the same."

2. (a). "In my estimation, his share is what he can get, and the operation of supply and demand gets him what he can get. If he can limit supply, he can get a higher wage. Too high a wage may kill the industry."

(b). "By means of collective bargaining they can get more than they can without. That's not saying that they can get their full share. What is their full share? Is it the whole product of the individual laborer? How is that to be measured? If that is paid, what about creation of surplus funds and depreciation funds, etc.?"

"I believe thoroughly in the bargaining theory of wages. If workers are stronger, they can get higher wages; if employer is stronger, he can bent wages down. Lower limit is bare physical subsistence; higher limit is full product of labor, etc. I expect you are fully acquainted with the reasoning of the bargaining theory."

Prof. E. E. Day (Harvard University, Cambridge, Mass.):

1. (a) "Categorical answer hardly possible in view of complexity of factors involved. There is probably none the less a tendency toward such increase."

(b) No answer.

(c) "I question the wisdom of any attempt to establish a rigid or mechanical relationship between wages and production."

2. (a) "No; if you mean by the wageworker's 'full share of the product' that share which would go to him under conditions of 'free and equal competition.' This follows from the fact that in an open labor market the wage earner commonly bargains at a disadvantage with the employer."

(b) "Yes."

Prof. Carroll W. Dooten (Harvard University, Cambridge, Mass.):

1. (a) "Not necessarily. Increase in physical production may be due to more laborers, more capital, and more land being used, and the share going to the individual laborer may not increase at all."

(b) "Yes; if the increased product is due to the increased efficiency of laborers."

(c) "Yes."

2. (a) "I do not think it would."

(b) "Yes."

Prof. Henry W. Farnam (Yale College, New Haven, Conn.):

"\* \* \* It does not seem to me that all of the questions can be answered in the form in which they are put. I shall therefore try to state my opinion on the subjects involved without always answering the question in the form in which it is put."

1. (a) "I believe that real wages do increase with the increase of physical production."

(b) "I think that they should so increase, whether the word 'should' is to be taken as implying a moral desideratum or an economic one."

(c) "Would it be desirable to establish a definite relation between wages and production? I do not know what this means. If it applies to the individual plant, I should say that it would be undesirable and impossible. The wageworkers would not like to feel that because a certain corporation happened to make large earnings in a given year they were to get a certain fraction of the total, while persons working equally hard in a similar line for a corporation which had not yet established itself or which was going through a temporary depression would get nothing. If, on the other hand, you mean to establish a relation between wages as a whole and production as a whole, the idea is so vague as to be meaningless. In my opinion. Moreover, it would involve, if it could be carried out, an entirely new economic calculus to the wage-worker. Wages are, in the worker's mind, always expressed in terms of support; the thing that interests the worker is to know how much he can count on per week or per year to pay for his family expenses. To try to express wages in terms of total production would have no meaning for him."

2. (a) "My answer to this question depends upon your definition of 'the open-labor market.' If you mean a market which is not only legally free but in which the different parties are reasonably on a par as regards intelligence, knowledge, and ability to wait, I should answer that demand and supply in such a market will secure the worker his full share of the product."

(b) "Collective bargaining seems to me essential to the establishment of a really open-labor market and therefore involved in my answer to question 2 (a)."

Prof. Irving Fisher (Yale College, New Haven, Conn.):

1. (a) "Yes."

(b) "Yes."

(c) "If you mean by law, I should think not."

2. (a) "Yes; approximately, except when the purchasing power of the dollar is changing rapidly."

(b) "Yes; provided collective bargaining doesn't entail strikes which stop production."

Prof. Edwin W. Kemmerer (Princeton University, Princeton, N. J.):

1. (a) "Not necessarily."

(b) "Yes; if labor maintains or improves its efficiency. No; if labor becomes less efficient and the increased production is attributable mainly to improved capital equipment and improved management."

(c) "Not between wages as a whole and physical production as a whole. That would be impossible, because of the continually changing degree to which labor and capital contribute to total production and to production in different times. Desirable in case of individual laborers."

2. (a) "No."

(b) "Yes."

Prof. J. E. Le Rossignol (Station A, Lincoln, Neb.):

1. (a) "Yes. There seems to be a close relation between the per capita product of industry and real wages, as can be shown by statistics of wages in various countries."

(b) "Yes. They should and would."

(c) "Yes. The more efficient laborer should receive more than the less efficient, and, in fact, he does. It would be possible, I think, for employers to make agreements with their employees along this line, as many do."

2. (a) "Yes; under conditions of free competition on both sides."

(b) "Yes; provided that the unions work together with the employers to secure increased production."

Dr. H. A. Mills (trade board, clothing industry, Chicago):

"It is a rather difficult thing to answer such questions as you submitted to me without writing a volume. A volume I shall not write. Under the circumstances, all that I shall do is answer the questions in a rough and general way."

1. (a) "Yes; it is usually so if the increase in physical production means the expanding of business or an increase in national income. It means the same thing."

(b) "Of course, I can not imagine a decent social philosophy which would make it possible for one to say no."

(c) "It would be impossible to establish a definite relation between wages and production. Such a thing is quite out of the question; our industrial organization being what it is. I would not establish a definite relation between them if the word 'definite' means 'fixed.' It is hoped that relatively more of the national income will go in wages as the years go by. At certain times, however, a situation may develop in which it would be impossible, for the time being, for labor to hold the fraction it has obtained."

2. (a) "One must make clear what he means by 'full share of the product.' I don't know what the worker's full share of the product is and no one does except a Marxian socialist. Of course, labor will not get as much without organization as it can get with it. Nor will it get as much without as it will with official wage boards in the different industries."

(b) "Again I say I do not know what their full share is, but collective bargaining brings returns to the workers. I don't think there is any question as to that."

Prof. E. A. Ross (University of Wisconsin, Madison):

"Although for 7 years I taught economics, I am all shot to pieces on the subject of theory of wages. Less and less do I put faith in the automatic forces regulating wages, and I attach more and more importance to the psychology of the two parties, to their comparative bargaining strength, etc."

"Of the inclosed questionnaire, I have answered only the queries under your second question. It would take a special explanation to make clear my position on the questions under 1. I trust, however, that it is the answer under 2 that will be more helpful for your purpose."

2. (a) "No."

(b) "Yes."

Prof. John A. Ryan (Catholic University, Washington, D. C.):

1. (a) "They have increased over long periods of time, but they do not seem to have increased since 1900."

(b) "Undoubtedly, under a proper system of distribution."

1. (c) "Yes."

2. (a) "No."

(b) "Yes."

Prof. H. R. Seager (Columbia University, New York):

1. (a) "They tend to; but there may, of course, be counteracting tendencies in any concrete situation."

(b) "Yes."



(c) "This would be highly desirable, provided that a fair and reasonable basic wage was determined upon to which differentials made possible by increasing production should be added."

2. (a) "Assuming that 'open market' means a sort of market that would be presented if the workers were unorganized, no."

(b) "Yes."

Prof. E. H. A. Seligman (Columbia University, New York):

1. (a) "Yes."

(b) "Yes."

(c) "Yes."

2. (a) "Not always."

(b) "Yes."

Prof. F. W. Taussig (Harvard University, Cambridge, Mass.):

1. (a) "Not necessarily. They usually have done so, in modern times, as the per capita output has increased."

(b) "It is desirable they should."

(c) "I do not see how it can be done."

2. (a) " \* \* \* full." This is a question-begging term. What is his full share? What is meant?

(b) " \* \* \* full." They can procure, in most cases, a somewhat larger share; how much larger, impossible to say with any definiteness."

Prof. A. A. Young (Harvard University, Cambridge, Mass.):

1. (a) "Yes; if the question refers to per capita production or income and to per capita or 'average' real wages. If the question refers to aggregate real wages and aggregate production, there is no clearly indicated relation."

(b) "Yes."

(c) "Desirable, but probably impracticable except through the bargaining process."

2. (a) "No."

(b) "Yes."

#### APPENDIX C.

[Reprinted from the American Economic Review, Vol. XI, No. 1, March, 1921; published by the American Economic Association.]

#### AN INDEX NUMBER OF PRODUCTION.<sup>1</sup>

[By Walter W. Stewart, Amherst College.]

The fluctuations in the physical volume of production must be measured before they can be interpreted or controlled. The nature and causes of the increase in population, the relative significance of the various sources from which products are drawn, the extent of the waste involved in the decrease of output during periods of industrial depression are matters to be determined quantitatively. These changes are the outcome of influences so diverse that, in order to explain them casually, the date and the degree of the fluctuations must be specified. To make these measurements is the purpose of an index number of production.

The need for such measurements is so evident and the use of index numbers of prices so common that the question arises why index numbers of production were not made long ago. One explanation lies in the kind of limits imposed upon inquiries by the traditions of economic theory, limits which left the study of production in terms of physical units outside the pale. When the economist regarded production as a technological process it became to him a mass of bewildering details. Technology seemed to comprise fields of specialized knowledge either beyond the comprehension of an economist or at least beyond the reach of his theoretical formulations. The variety and unfamiliarity of the units of measurement, the rate of change in methods of production, the scale and complexity of industrial operations discouraged any search for generalizations. Such a field, he concluded, might better be left to the specialists, to the technicians of industry. So far as economic theory was concerned, therefore, the cause and consequences of the growth of technology remained the great unknown, and conclusions from deductive arguments were protected by the

<sup>1</sup> A paper read at the thirty-third annual meeting of the American Economic Association held at Atlantic City December 28, 1920. In the collection of the statistics and in the computation of the index numbers the writer has had the assistance of Miss Caroline Emerson and Miss Stella Stewart.

phrase "assuming the state of the industrial arts to remain the same." In the meantime, the problem of properly managing our industrial resources suffered from the faults characteristic of all merely specialized thinking.

A further reason why the economist shunned the analysis of the production process in terms of physical units is that, in common with the business community, he believed the facts could be adequately stated and handled in monetary terms alone. He congratulated the community on having a common denominator of money in which to do its thinking. Like the accountant, he took inventories in terms of dollars and cents, and in the absence of any specific knowledge about the changes in the volume of goods and of equipment, he ordinarily assumed a coincidence between statements of money values and of national underlying industrial quantities. Statements of national income and of national wealth in money terms may be given a clear meaning, but to find these items and measure them in money terms alone is to obliterate distinctions which must be prescribed if we are to understand and administer industrial processes. No question need be raised about the usefulness of this pecuniary accountancy for business purposes; likewise there can be no question about the need for an industrial accountancy for industrial purposes.

A system of industrial accountancy can not be confined to recording the activities of a single plant; it must measure the flow of products from great groups of industries. As industrial economists we are interested not merely in the management of single factories; we are concerned also with the effectiveness of the correlation between industries and groups of industries. Fields, mines, factories, and railroads, working together under a coordinated plan, make up the industrial system; their total product is largely determined by the effectiveness with which they come into gear with one another. What is needed, for purposes of measurement and for guidance, is a system of index numbers of production, so constructed as to reveal the behavior of the industrial system in its parts and as a whole.

Experience in the construction and use of index numbers of prices indicates the methods to be used in measuring the changes in the level of production. In making a production index one is confronted with difficulties similar to those met in constructing a price index. There is the problem of selecting the commodities to be included, the choice of base periods, and the problem of weighting the selected samples in such a way that each will have its proportionate influence upon the final result. To an explanation of how these problems were dealt with in the construction of the present index number of production, we may now turn.

This index number is based upon a total of 91 different series of commodities.<sup>2</sup> For two-thirds of these, production figures are available for every year from 1890 to 1919, and for the remainder the information is available beginning in 1904. The following table shows the number of commodities in each of the groups and subgroups:

|                      |    |
|----------------------|----|
| All commodities..... | 91 |
| Materials.....       | 39 |
| Manufactures.....    | 50 |
| Transportation.....  | 2  |

<sup>2</sup> The work of the price section of the War Industries Board was especially useful in making a choice of methods of construction. In addition to the index of prices, an index was constructed under the direction of Prof. Wesley C. Mitchell, measuring the fluctuations in the physical volume of production for the period 1913 to 1918. (History of Prices During the War, Summary, War Industries Board Price Bulletin, No. 1, pp. 44-46.) Also, Mr. Wolman, as chief of the division of statistics and production, it is evident during the war that the problem of production could be handled statistically. Out of the war experience, in fact, there came a new recognition of the desirability of measuring the physical volume of production. Mr. Edmund E. Day, working from such the same data as those used in the present study, but by a somewhat different method, has also just completed the construction of an index number of production. (The Review of Economic Statistics, September-December, 1920, the Harvard University Press.)

A list of the commodities arranged by groups and a table of the index numbers are presented on pp. 67-68. The sources of information were for the most part official publications. Among these were the bulletins issued by the various bureaus of the Department of Agriculture, the Geological Survey, the Bureau of the Census, the Bureau of Agriculture, the Geological Survey, the Bureau of Foreign and Domestic Commerce, and Fisheries, Bureau of Internal Revenue, Bureau of Foreign and Domestic Commerce, and the Interstate Commerce Commission. Other sources were the publications of such commercial organizations as the American Iron and Steel Institute, the New York Board of Trade, and the New Orleans Board of Trade.







information concerning the output of other commodities becomes available they may be included in the index. The present method of construction permits their inclusion without breaking the continuity of the index. The gathering of such additional information and the testing of the adequacy of existing data are tasks which must not be slighted. In the present state of the statistics of production such work is more important than the choice between alternative methods of organizing the information after it is once collected. So long as whole industries are omitted from the index, such as the building industry, the work of measuring the changes in the volume of production is little more than begun. Certainly the extent of agreement among the index numbers of production which have so far been constructed is no more significant than the fact that they all have the common shortcoming of omitting the building industry. Any interpretation of these index numbers must begin with a recognition of those industrial activities which are now unmeasured and omitted. The increase in precision will be in proportion to the attention paid these present shortcomings.

WALTER W. STEWART,  
Amherst College.

### Index numbers of production.

[Average production 1911-1913=100.]

| Year.     | All com-<br>modi-<br>ties. | Materials.          |                    | Minerals. | Manufacture.               |                       |                      |                               | Prices,<br>all com-<br>modi-<br>ties. |
|-----------|----------------------------|---------------------|--------------------|-----------|----------------------------|-----------------------|----------------------|-------------------------------|---------------------------------------|
|           |                            | Total<br>materials. | Farm<br>materials. |           | Total<br>manu-<br>facture. | Manufactured<br>from— |                      | Total<br>transpor-<br>tation. |                                       |
|           |                            |                     |                    |           |                            | Farm<br>products.     | Mineral<br>products. |                               |                                       |
| 1890..... | 45                         | 52                  | 57                 | 30        | 42                         | 61                    | 17                   | 29                            | 82                                    |
| 1891..... | 54                         | 66                  | 73                 | 32        | 46                         | 68                    | 16                   | 31                            | 83                                    |
| 1892..... | 50                         | 58                  | 62                 | 34        | 47                         | 67                    | 19                   | 34                            | 77                                    |
| 1893..... | 49                         | 58                  | 63                 | 34        | 42                         | 61                    | 16                   | 36                            | 78                                    |
| 1894..... | 48                         | 57                  | 62                 | 33        | 43                         | 61                    | 17                   | 32                            | 70                                    |
| 1895..... | 57                         | 68                  | 74                 | 37        | 53                         | 75                    | 23                   | 32                            | 71                                    |
| 1896..... | 57                         | 72                  | 79                 | 39        | 46                         | 65                    | 20                   | 35                            | 67                                    |
| 1897..... | 62                         | 72                  | 78                 | 40        | 61                         | 87                    | 26                   | 35                            | 67                                    |
| 1898..... | 66                         | 77                  | 84                 | 43        | 58                         | 78                    | 32                   | 48                            | 70                                    |
| 1899..... | 65                         | 77                  | 82                 | 48        | 57                         | 70                    | 38                   | 44                            | 75                                    |
| 1900..... | 66                         | 78                  | 82                 | 52        | 57                         | 74                    | 35                   | 50                            | 81                                    |
| 1901..... | 67                         | 81                  | 73                 | 55        | 69                         | 87                    | 44                   | 52                            | 80                                    |
| 1902..... | 77                         | 87                  | 82                 | 57        | 71                         | 87                    | 50                   | 57                            | 86                                    |
| 1903..... | 75                         | 83                  | 85                 | 64        | 68                         | 83                    | 49                   | 62                            | 86                                    |
| 1904..... | 80                         | 89                  | 84                 | 66        | 74                         | 91                    | 52                   | 63                            | 87                                    |
| 1905..... | 86                         | 90                  | 94                 | 74        | 86                         | 98                    | 71                   | 68                            | 87                                    |
| 1906..... | 91                         | 96                  | 100                | 77        | 90                         | 97                    | 83                   | 77                            | 90                                    |
| 1907..... | 89                         | 90                  | 89                 | 86        | 91                         | 98                    | 82                   | 84                            | 95                                    |
| 1908..... | 84                         | 91                  | 95                 | 79        | 78                         | 94                    | 87                   | 77                            | 92                                    |
| 1909..... | 94                         | 95                  | 95                 | 87        | 96                         | 102                   | 88                   | 86                            | 98                                    |
| 1910..... | 93                         | 98                  | 98                 | 94        | 93                         | 95                    | 92                   | 95                            | 101                                   |
| 1911..... | 93                         | 93                  | 93                 | 93        | 92                         | 97                    | 85                   | 92                            | 96                                    |
| 1912..... | 106                        | 109                 | 111                | 101       | 104                        | 102                   | 107                  | 101                           | 102                                   |
| 1913..... | 101                        | 98                  | 95                 | 106       | 104                        | 101                   | 108                  | 106                           | 101                                   |
| 1914..... | 101                        | 106                 | 108                | 100       | 95                         | 103                   | 85                   | 99                            | 101                                   |
| 1915..... | 112                        | 113                 | 116                | 108       | 111                        | 110                   | 110                  | 106                           | 102                                   |
| 1916..... | 117                        | 106                 | 101                | 123       | 131                        | 117                   | 145                  | 123                           | 126                                   |
| 1917..... | 124                        | 113                 | 110                | 131       | 135                        | 118                   | 148                  | 135                           | 178                                   |
| 1918..... | 121                        | 111                 | 108                | 132       | 137                        | 126                   | 145                  | 141                           | 199                                   |
| 1919..... | 120                        | 110                 | 112                | 112       | 126                        | 120                   | 118                  | 138                           | 215                                   |

<sup>1</sup> Bureau of Labor Statistics index converted to base 1911-1913=100.

### LIST OF COMMODITIES INCLUDED IN INDEX OF PRODUCTION.

[\* Included from 1904-1919.]

#### Materials from:

I. Farms: Apples; barley; corn; cotton, raw; hay; oats; peaches\*; potatoes, white; potatoes, sweet\*; rice; rye; sugar, beet; sugar, cane; tobacco; wheat; wool, raw.

II. Mines: Coal, anthracite; coal, bituminous; copper; gold; iron ore; lead; petroleum; pyrites; quicksilver; salt; silver; sulphur ore\*; zinc.

III. Forests: Douglas fir\*; hemlock\* oak\*; spruce\*; western yellow pine; white pine\*; yellow pine.\*

IV. Fisheries: Cod\*; haddock\*; mackerel.\*

#### Manufacture:

V. Manufactured from farm products: Coffee, used in manufacture; cotton, used in manufacture\*; cotton seed; cottonseed oil; cake and meal, cotton; hulls, cotton\*; lint, cotton\*; hemp, manilla, used in manufacture; jute, used in manufacture; sisal grass, used in manufacture; molasses; cigarettes; cigars; tobacco and snuff; wheat, used in manufacture; beef\*; mutton\*; pork\*; hides, cattle\*; skins, sheep\*; silk, used in manufacture; wool, used in manufacture.

VI. Manufactured from mineral products: Brick, common\*; brick, front; brick, vitrified\*; cement; coke; copper, used in manufacture; gold, used in manufacture; pig iron; steel ingots and castings; bars, merchant\*; plates and sheets; rails; structural shapes\*; skelp\*; wire rods\*; tin plate\*; nails, cut; nails, wire; lead, used in manufacture; zinc, used in manufacture.

VII. Manufactured from forest products: Lath\*; shingles; turpentine; rubber, used in manufacture.

VIII. Manufactured from fishery products: Salmon, canned.\*

#### Transportation:

IX. Transportation: Freight, ton-miles; passenger, passenger-miles.

### APPENDIX G.

#### STUDY OF REAL WAGES, 1890-1918.

[By Dr. Paul H. Douglass, of the University of Chicago.]

NOTE.—Dr. Paul H. Douglass's study of real wages will be published in the American Economic Review of September, 1921, and no previous publication of any of the following material should be made. We are indebted to Doctor Douglass for permission to submit an advance copy with this report.

After an analysis of the material available and a discussion of its proper statistical treatment Doctor Douglass goes on as follows:

(3) *Real wages*.—We can now bring our material together into a final table summarizing the trend of hours per week, wages per week, full-time weekly earnings, and retail food prices. From the last three of these items the relative purchasing power of an hour's work and a full-time week's work can be computed. Table VI contains all this material.

An analysis of this table shows that—

TABLE VI.—Index of real wages, 1890-1918.

| Year.     | Hours per week. | Wages per hour. | Full-time weekly wages. | Retail food prices. | Purchasing power measured by retail prices of food of— |                            |
|-----------|-----------------|-----------------|-------------------------|---------------------|--------------------------------------------------------|----------------------------|
|           |                 |                 |                         |                     | Wages per hour.                                        | Full-time weekly earnings. |
| 1890..... | 100.9           | 96.4            | 190.3                   | 101.9               | 97.5                                                   | 98.4                       |
| 1891..... | 100.8           | 99.3            | 191.1                   | 104.4               | 96.0                                                   | 96.8                       |
| 1892..... | 100.8           | 100.1           | 100.9                   | 101.6               | 98.5                                                   | 99.3                       |
| 1893..... | 100.3           | 101.1           | 101.4                   | 104.1               | 97.1                                                   | 97.5                       |
| 1894..... | 99.9            | 98.0            | 97.9                    | 99.2                | 98.8                                                   | 98.7                       |
| 1895..... | 100.1           | 98.2            | 98.3                    | 97.1                | 101.1                                                  | 101.2                      |
| 1896..... | 99.7            | 100.2           | 99.9                    | 95.2                | 103.3                                                  | 104.6                      |
| 1897..... | 99.5            | 100.2           | 99.7                    | 96.7                | 101.6                                                  | 103.2                      |
| 1898..... | 99.3            | 100.9           | 100.2                   | 96.7                | 101.2                                                  | 100.5                      |
| 1899..... | 98.7            | 104.4           | 101.1                   | 100.8               | 101.6                                                  | 100.3                      |
| 1900..... | 97.9            | 106.8           | 104.6                   | 105.0               | 103.7                                                  | 101.6                      |
| 1901..... | 97.5            | 108.7           | 105.9                   | 108.5               | 100.1                                                  | 97.6                       |
| 1902..... | 96.6            | 112.9           | 106.0                   | 114.6               | 98.5                                                   | 95.1                       |
| 1903..... | 95.7            | 117.2           | 112.1                   | 114.7               | 102.2                                                  | 97.6                       |
| 1904..... | 95.4            | 118.2           | 112.6                   | 116.2               | 101.7                                                  | 96.9                       |
| 1905..... | 95.4            | 120.0           | 114.4                   | 116.4               | 101.1                                                  | 98.3                       |
| 1906..... | 94.8            | 123.1           | 118.6                   | 120.3               | 100.9                                                  | 98.6                       |
| 1907..... | 94.3            | 131.2           | 125.7                   | 125.9               | 104.2                                                  | 98.2                       |
| 1908..... | 93.6            | 131.6           | 123.1                   | 130.1               | 101.2                                                  | 94.6                       |
| 1909..... | 93.4            | 133.4           | 124.4                   | 137.2               | 97.2                                                   | 95.7                       |
| 1910..... | 92.5            | 137.0           | 128.5                   | 144.1               | 95.1                                                   | 87.8                       |
| 1911..... | 92.2            | 139.8           | 128.9                   | 143.0               | 97.8                                                   | 90.1                       |
| 1912..... | 91.1            | 143.9           | 132.6                   | 154.2               | 94.6                                                   | 85.9                       |
| 1913..... | 90.6            | 149.6           | 135.2                   | 155.7               | 96.1                                                   | 86.8                       |
| 1914..... | 90.1            | 153.1           | 137.9                   | 158.5               | 96.5                                                   | 87.0                       |
| 1915..... | 89.2            | 155.5           | 135.5                   | 159.5               | 97.5                                                   | 88.8                       |
| 1916..... | 89.7            | 164.5           | 144.8                   | 177.6               | 92.6                                                   | 80.8                       |
| 1917..... | 88.5            | 167.0           | 146.9                   | 203.4               | 71.6                                                   | 64.0                       |
| 1918..... | 88.5            | 211.3           | 187.7                   | 206.6               | 79.3                                                   | 70.4                       |

1. The purchasing power of an hour's wages was 20.7 per cent less in 1918 than it had been during the years 1890-1899, and that the purchasing power of full-time weekly earnings was 26.6 per cent less than during this period.

2. This great decrease was concentrated almost wholly in two periods: (a) the years 1907-1912, (b) the years 1916-17.

3. During the period 1907-1912 wages per hour increased from 131.2 to 145.9, or 11 per cent, yet from 1913 to 1918 they increased from 149.6 to 211.3, or 41 per cent.

4. During the years 1907-1912 full-time weekly earnings rose from 123.7 to 135.2, or 7 per cent, while in the period 1913-1918 they increased from 135.2 to 187.7, or 38 per cent.

5. During the period 1907-1912 retail food prices rose from 125.9 to 154.2, or 22 per cent, while during the years 1913-1918 they increased from 155.7 to 206.6, or 31 per cent.

6. In the years 1907-1912 the purchasing power of hourly wages as measured by retail food prices decreased from 104.2 to 94.6, or 9 per cent, while from 1913 to 1918 the decrease was from 96.1 to 79.3, or a drop of 17 per cent.

7. In the years 1907-1912 the purchasing power of full-time weekly earnings decreased from 98.2 to —, or 13 per cent, while from 1913 to 1918 they fell from 84.8 to 70.4, or a decrease of 19 per cent.

8. From 1912 to 1916 money wages not only held their own but indeed gained slightly upon prices, but the sudden upward movement of prices in 1916 was accompanied by only a slight increase in wage rates, and the result was that in two years the purchasing power of hourly wages declined 27.1 per cent and the purchasing power of full-time weekly earnings 26 per cent.

9. Money wages began to gain upon prices in 1918, and in consequence real wages rose in that year over their low-water mark of 1917.

Certain cautions, however, should be observed in using this material:

(1) The industries covered do not include such war-time industries as munitions plants. Some of the occupations within these industries enjoyed increases in wages more than sufficient to compensate for the increase in the cost of living. Household servants are naturally not included, and they, too, profited. On the other hand, neither are the railroad workers and the coal miners included and their wages notoriously lagged behind the increase in prices.<sup>1</sup> Farm laborers also lost during the war period, as Professor Viner has shown.<sup>2</sup> Moreover, the wage statistics after 1907 refer chiefly to union workmen. They consequently do not include most of the unskilled workers and, save for the year 1918, it is extremely probable that the increases for this class were not as great as for the union workers, who were at once more skilled and possessed stronger bargaining powers.

(2) The wage scales used since 1907 for seven of the industries were the union scales. Until 1917, and perhaps even until 1918, the union scale did actually represent in practice the prevailing wage of a locality for efficient labor.<sup>3</sup> In 1918, however, due to the relative scarcity of labor, a much larger percentage than usual of the workers were paid in excess of this scale. To the extent that this occurred, the use of the union scale fails to give a completely accurate representation of actual wage rates. This criticism, of course, does not apply to the three industries for which pay-roll data were used.

(3) As has been pointed out, the use of retail food prices exaggerates the increase in the cost of living for the years 1916, 1917, and 1918.<sup>4</sup> The actual decline in real wages for these years was accordingly somewhat less than is shown above.

(4) As has been explained, the relative full-time weekly earnings do not represent the relative amounts of money actually received per week. If the relative amount of unemployment or underemployment should decrease, then the relative actual amounts received would (to that extent at least) increase. Likewise, if the relative amount of overtime increased, the relative actual earnings would rise. The industrial pressure brought by the war did, beyond doubt, decrease unemployment and increase overtime. Two questions may then be asked: (a) Was the increase in employment per week more than sufficient to offset the loss in hourly wage rates? What was the course of actual money earnings per week as compared with the cost of living? (b) Which is the more significant, actual earnings or wage rates? These will now be considered in turn:

(a) Practically the only authoritative material on actual weekly wage payments, including both overtime and undertime, is that collected by the industrial commissions of New York and Wisconsin and published in their respective labor-market bulletins. The former covers some 600,000 workmen, while the latter is based upon approximately 50,000 workmen. In both cases a very narrow base is used for computation, the single month of June, 1914, serving in New York and the first quarter of 1915 in Wisconsin. The following table shows the purchasing power of average weekly wage payments in the manufacturing industries of each of these two States in terms of their respective bases.

<sup>1</sup> See report of the Railroad Wage Commission to the Director General of the Railroads (1918), published by the United States Railway Administration; also award and recommendations of the United States Bituminous Coal Commission (1920) pp. 34-42.

<sup>2</sup> Jacob Viner, Who Paid for the War, Journal of Political Economy (Jan. 1920) pp. 70-71.

<sup>3</sup> Union Scale of Wages and Hours of Labor, U. S. Bureau of Labor Statistics Bulletin No. 214, p. 11.

<sup>4</sup> For the years 1919 and 1920, on the other hand, the retail food index was considerably less than the cost of living.



manufacturers"—that is, an almost constant share of the addition which factories make to the value of the raw materials they handle.

(3) But all the studies of "real" wages indicate that the physical quantity of food which factory hands could buy with their wages decreased from 1890 to 1914.

How can these three statements, each seemingly supported by trustworthy figures, be reconciled with each other? How can a constant share in a flow of goods which increases faster than the population leave the factory workers with a diminished supply of subsistence?

#### NEW DISTRIBUTION METHODS SUGGESTED.

Mr. Soule's tentative solution of this puzzle is that the people engaged in distributing goods, the merchants and shopkeepers, have been taking an ever larger slice out of the national income for themselves. Retail prices have advanced faster than factory prices. This rapid advance in the prices which they pay has taken away from the factory workers all their gains from heightened efficiency as producers—and more, too. So Mr. Soule concludes: The best way to reduce labor unrest is to check the distributors' encroachments upon the real incomes of other people by organizing the process of distribution efficiently.

When one finishes Mr. Soule's article he is inclined to accept the solution. But reflection suggests a cloud of doubts. After all, is merchandising growing more inefficient or more costly to consumers, despite the department store, the chain store, and the mail-order house? If there has been a decline in the efficiency of merchandising, has it really been great enough to offset the whole gain in the efficiency of manufacturing? Is not the period which Mr. Soule covers (1890-1914) exceptional? Has the factory worker been losing ground ever since we began building factories?

These questions are as hard to answer as they are easy to ask. But I have a colleague to whom puzzles of this sort are the wine of life. Dr. Willford I. King knows as do few others what economic data have been collected in this country, what they represent, and how they may be combined to answer questions of which the compilers did not dream. At my suggestion Doctor King looked over Mr. Soule's puzzle, took it apart, tested each piece, and put the pieces together again with a few readjustments. What follows is based mainly upon his work. Together we have covered a somewhat longer period than Mr. Soule; we have refined a bit upon his figures, and we think we have bettered his solution of the puzzle, though we have not answered all our own questions. To keep our rather complicated argument as clear as may be, a formal scheme of presentation is necessary.

#### A SOLUTION OF THE PUZZLE.

Mr. Soule's statement of the puzzle is substantially valid. But for the sequel we need a more precise statement, which we draw up as follows:

(1) In the generation preceding the war production increased much faster than population.

The rates of increase from 1890 to 1914 were: Population of the United States, 58 per cent; production of all classes of commodities, 124 per cent; production of manufactured goods, 126 per cent.

The percentage increases in production here are based upon the "index number of production" compiled by Walter W. Stewart. The compilation includes 91 commodities of all classes and 50 manufactured products. The substantial accuracy of Stewart's series is attested by its agreement with the production indexes made by Lay, King & Snyder.

(2) Within this period factory wage earners suffered a slight decline in their share of the "value added by manufacture." It should be noted, however, that after 1890 there was a decline also in the percentage of the "value added" which went to profits, depreciation, interest, rent, and miscellaneous expenses.

The gains at the expense both of wage earners and of property owners were scored by salaried workers—clerks and salesmen as well as managers.

These changes in the division of the "value added by manufacturers" are shown by the following table. Critical readers are assured that Doctor King has excluded the hand trades from the earlier figures and computed the percentages as nearly as may be upon a uniform basis:

| Year.     | Wages.    | Salaries. | Profits, interest, depreciation, rent, and miscellaneous. |
|-----------|-----------|-----------|-----------------------------------------------------------|
|           | Per cent. | Per cent. | Per cent.                                                 |
| 1890..... | 44        | 8         | 48                                                        |
| 1899..... | 42        | 8         | 50                                                        |
| 1904..... | 41        | 9         | 50                                                        |
| 1909..... | 40        | 11        | 49                                                        |
| 1914..... | 41        | 13        | 46                                                        |
| 1919..... | 42        | 12        | 46                                                        |

#### FACTORY WORKERS ALSO SUFFERED.

(3) Despite their nearly constant share in a rapidly growing output, factory wage earners suffered a heavy loss in the amount of food they could buy with their "full-time yearly earnings," as computed from the returns of the census of manufacturers.

Doctor King's figures show the following degree of loss:

| Year.     | Average full-time annual wages of factory hands. | Index of retail food prices on 1913 base. | Value at 1913 prices of food purchasable with annual wages. | Index of real wages (in food), 1890=100. |
|-----------|--------------------------------------------------|-------------------------------------------|-------------------------------------------------------------|------------------------------------------|
| 1890..... | \$444.80                                         | 70                                        | \$635                                                       | 100                                      |
| 1899..... | 425.20                                           | 68                                        | 627                                                         | 99                                       |
| 1904..... | 477.30                                           | 76                                        | 628                                                         | 99                                       |
| 1909..... | 518.00                                           | 83                                        | 582                                                         | 92                                       |
| 1914..... | 579.70                                           | 102                                       | 568                                                         | 89                                       |
| 1919..... | 1,191.90                                         | 186                                       | 625                                                         | 98                                       |

This method of computing real wages leaves much to be desired; but it is less unsatisfactory than the common method of using wage rates per hour or week. And when the latter method is resorted to the results are even less favorable to the wage earner, as the reader may see by turning to Paul H. Douglas's paper in the American Economic Review for last September.

If, as these figures indicate, Mr. Soule's statement of the puzzle is substantially correct, can we accept his solution?

(1) One rival solution is that food prices may have risen much more rapidly than the prices of other goods, so that the wage earners' loss of real income is not so great as the index of retail food prices makes it appear.

We lack the retail prices of other classes of goods which are needed to test this suggestion conclusively. But the Bureau of Labor Statistics index numbers show that at wholesale foods increased less rapidly than "all commodities." The price changes between 1890-1894 and 1910-1914 by groups of commodities run as follows:

|                             | Rise, per cent. |                                | Rise, per cent. |
|-----------------------------|-----------------|--------------------------------|-----------------|
| Farm products.....          | 50              | Miscellaneous group.....       | 16              |
| Building materials.....     | 45              | Chemicals and drugs.....       | 14              |
| Fuel and lighting.....      | 37              | Cloths and clothing.....       | 11              |
| House furnishing goods..... | 30              | Metals and metal products..... | 4               |
| Food, etc.....              | 21              | All commodities.....           | 20              |

(2) What evidence is there that those engaged in the distributive process have been receiving an increasing share of the national product?

Very little evidence, for there is no important part of the national economy about which so little is definitely known as merchandising.

A comparison of the Bureau of Labor Statistics index numbers for food prices at wholesale and retail indicates that the changes between 1890-1894 and 1910-1914, were as follows: Retail prices rose 39 per cent; wholesale prices

rose 21 per cent. But the two lists of commodities used in these index numbers differ so widely that this comparison is not conclusive. Further, the retail shop in 1910-1914 may have been furnishing more "service" than in 1890-1894; for example, more telephone connections for the convenience of customers, larger stocks to select from, and more prompt delivery.

Another bit of indirect evidence is supplied by the number of persons reported by the census of occupations as engaged in "Trade and finance." The following figures show that this number has been increasing very rapidly:

| Year.     | Number of persons occupied in trade and finance. | Percentage of all persons having gainful occupations. |
|-----------|--------------------------------------------------|-------------------------------------------------------|
| 1890..... | 1,487,000                                        | 6.4                                                   |
| 1900..... | 2,313,000                                        | 8.0                                                   |
| 1910..... | 3,265,000                                        | 8.6                                                   |
| 1920..... | 4,241,000                                        | 10.2                                                  |

So far as they go, both these bits of evidence lend support to Mr. Soule's solution. But is not the growing share of merchandising in the national income merely one phase of the shifting among the shares of the major branches of industry? Can we not get a view of the situation as a whole, instead of confining ourselves to merchandising?

(3) Doctor King has been able to collect data regarding (a) numbers occupied, (b) physical product, and (c) value product in agriculture, mining, transportation, and manufacturing. The value-product figures are his own estimates; the physical-product figures are Professor Stewart's index numbers; the numbers occupied are taken from the census.

[Indices, 1890=100.]

|                     | Number of persons at work— |           |           |           |
|---------------------|----------------------------|-----------|-----------|-----------|
|                     | 1890-1899                  | 1900-1909 | 1910-1919 | 1918-1919 |
| Agriculture.....    | 100                        | 113       | 137       | 129       |
| Mining.....         | 100                        | 145       | 214       | 282       |
| Manufacturing.....  | 100                        | 128       | 198       | 269       |
| Transportation..... | 100                        | 134       | 216       | 282       |
| Physical product:   |                            |           |           |           |
| Agriculture.....    | 100                        | 144       | 167       | 197       |
| Mining.....         | 100                        | 160       | 240       | 373       |
| Manufacturing.....  | 100                        | 136       | 229       | 300       |
| Transportation..... | 100                        | 152       | 257       | 476       |
| Value product:      |                            |           |           |           |
| Agriculture.....    | 100                        | 163       | 303       | 801       |
| Mining.....         | 100                        | 179       | 286       | 670       |
| Manufacturing.....  | 100                        | 134       | 222       | 578       |
| Transportation..... | 100                        | 132       | 222       | 421       |

These figures indicate that the numbers of persons working on farms increased much less rapidly than the numbers working in mines.

(Note that the actual decline in the number of persons engaged in agriculture between 1910 and 1919 reported by the census is due in large measure to a change in the treatment of farmers' wives and children working on the home farm and a change in the month of enumeration.)

The increase in physical product was also much less rapid on farms than in mines, factories, or transportation. But the increase in value product was fastest on farms and slowest in transportation and manufactures.

#### INCREASE IN PHYSICAL PRODUCT.

If the same data be rearranged under each industry to show the numbers at work, the physical product, and the value product, they indicate that the increase in the physical product has been more rapid than the increase in the number

of workers in all branches of industry. Manufactures, not agriculture, show the slowest gain of physical product compared with the increase in men at work.

From 1890 to 1909 the increase in the value product was much more rapid than the gain in physical product in agriculture, at about the same pace as the gain in physical product in mining and manufactures, and less than the gain in physical product in transportation.

Still a third arrangement of the data for numbers at work and value product should be noted—one in which the data for physical product can not be used, because they are merely index numbers. This arrangement shows the numbers at work and the value product of our four branches of industry as percentages of the total number having gainful occupations and percentages of the total income of the country.

#### Percentages of total number of persons having gainful occupations.

|                                 | 1890 | 1900 | 1910 | 1920 |
|---------------------------------|------|------|------|------|
| Attributed to value product of— |      |      |      |      |
| Agriculture.....                | 39   | 36   | 33   | 26   |
| Mining.....                     | 1.7  | 1.9  | 2.4  | 2.6  |
| Manufacturing.....              | 18   | 18   | 22   | 27   |
| Transportation.....             | 4.7  | 5    | 6.2  | 7.4  |
| Total.....                      | 63   | 61   | 64   | 63   |

#### Percentages of the total income of the United States.

|                                 | 1899 | 1909 | 1919 | 1918 |
|---------------------------------|------|------|------|------|
| Attributed to value product of— |      |      |      |      |
| Agriculture.....                | 12.8 | 14.1 | 16.2 | 20.4 |
| Mining.....                     | 2.3  | 3.1  | 4.1  | 3.3  |
| Manufacturing.....              | 25.6 | 25.1 | 27.5 | 29.4 |
| Transportation.....             | 16.4 | 16.2 | 19.6 | 18.7 |
| Total.....                      | 51.3 | 49.5 | 52.4 | 61.8 |

If these figures are trustworthy, then from 1890-1910 the share of the country's labor force devoted to agriculture was declining, while the shares of the labor force devoted to mining, manufacturing, and transportation were increasing.

On the contrary, the share of agriculture in the national income was increasing rapidly, the share of mining was increasing less rapidly, while the shares of manufacturing and transportation were declining.

These shiftings may continue in the future, because they had not gone far enough even by 1918 to bring agriculture's quota of the national income up to its quota of the labor force, while the quotas of mining, manufacturing, and transportation in the national income were larger than their quotas in the working force.

#### CONCLUSIONS.

From 1890 to 1909—

(1) The share of manufactures in the national income declined from 25.6 per cent to 23.5 per cent despite (or perhaps because of) a rapid increase in the physical output of manufactured goods. On the other hand, agriculture increased its share in the national income from 12.8 per cent to 16.2 per cent, despite (or perhaps because of) a much more moderate increase in physical production. Perhaps merchandising and other trades also increased their shares in the national income, but we lack data to test these hypotheses.

(2) Wage earners in factories suffered a slight decline (from 44 per cent to 40 per cent) in their share of this slowly shrinking fraction in the national



income." Hence these wage earners received a somewhat smaller share of the national income in 1909 than in 1899. The figures run as follows:

|           | National income<br>(King's estimate). | Wages paid (census of manufactures). | Percentage of national income. |
|-----------|---------------------------------------|--------------------------------------|--------------------------------|
| 1899..... | \$1,980,000,000                       | \$1,800,000,000                      | 90.4                           |
| 1909..... | 28,780,000,000                        | 2,430,000,000                        | 8.4                            |
| 1914..... | 29,940,000,000                        | 4,380,000,000                        | 14.6                           |

(3) This slightly shrinking fraction of the national income had to be divided among an increasing fraction of the working population.

|           | Number<br>having<br>skillful<br>occupations. | Number<br>engaged in<br>manufactures<br>(census of<br>occupations). | Per cent<br>of total. |
|-----------|----------------------------------------------|---------------------------------------------------------------------|-----------------------|
| 1899..... | 23,320,000                                   | 4,160,000                                                           | 17.8                  |
| 1909..... | 38,170,000                                   | 8,940,000                                                           | 23.6                  |

(4) It is true that the national income increased rapidly in these years, but when the price factor in this increase is eliminated (as it must be when we consider changes in real wages) the remaining increase was not quite so rapid as the increase in the number of persons engaged in manufactures.

| Year.     | National income<br>at 1913 prices. | Persons<br>engaged in<br>manufactures. | Relative num-<br>ber on basis<br>1899=100. | Num-<br>ber of<br>income persons. |
|-----------|------------------------------------|----------------------------------------|--------------------------------------------|-----------------------------------|
| 1899..... | \$15,330,000,000                   | 4,160,000                              | 100                                        | 11,100                            |
| 1909..... | 30,100,000,000                     | 8,940,000                              | 114                                        | 138                               |

(5) Hence the decrease in the share of these wage earners in the national income caused them a loss in real wages per capita.

When real wages per capita are computed by taking the manufacturing wage-earners' share in the national income reduced to constant purchasing power, and dividing the sum among all persons reported by the census of occupations as engaged in manufactures, the results indicate a decline in real wages somewhat greater than Doctor King gets by computing average full-time annual earnings from the census of manufactures and applying a retail price index. Of course, it is only the relative figures in this comparison that can be expected to agree with each other.

| Year.     | Computed<br>from<br>census of<br>occupations<br>and<br>national<br>income. | Computed<br>from<br>census of<br>occupations<br>and<br>manufactures<br>income. | Relative figures on<br>1899 base from<br>census of<br>occupations. | Relative figures on<br>1899 base from<br>census of<br>manufactures. |
|-----------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------|
| 1899..... | 408                                                                        | 635                                                                            | 100                                                                | 100                                                                 |
| 1909..... | 421                                                                        | 627                                                                            | 97                                                                 | 99                                                                  |
| 1909..... | 434                                                                        | 562                                                                            |                                                                    | 92                                                                  |

(6) It is not unlikely that this decline in the economic fortunes of wage earners in manufactures has been shared by those who draw property incomes from manufactures. But salaried employees in manufactures, as a class, may have offset the loss or made a gain because of their increasing fraction in the "value added by manufactures."

(7) Dr. King has evidence that the wage earners' position in manufactures improved from 1890 to 1899. Money wages increased and after 1895 prices declined.

(8) He also has evidence that while living expenses rose faster than wage rates during the war, wage earning families presently made more than compensating gains from full employment for every one who wanted a job, from overtime pay and bonuses of various sorts. This conclusion is confirmed by Alvin H. Hansen's study of the purchasing power of wage earners in 1914-1920, published in the Journal of the American Statistical Association for March. Needless to say, the wage earners' losses in 1914-1915 and 1921-1922 go far to offset their gains in 1916-1920.

Are these conclusions trustworthy? Of course, their claim to credence rests upon the underlying data, and these data are subject to varying margins of error. Certainly no one should accept the figures given here as accurate determinations. At the best they are rough approximations to the unknown truth. Yet the reader will notice that the results yielded by the different sets of data confirm each other on a broad view. That consistency puts the burden of proof upon those who question the substantial validity of the results.

To question these results, however, is a service if the questioning stimulates effort to better or to extend the census. One of the crucial tests of our civilization is whether we can gain sufficient insight into economic processes to know what results we are getting and to form an intelligent policy for the future. To gain that insight we must extend and improve statistics of the sort Mr. Soule has put together.

One of the best ways to promote the improvements of statistics is to make the best use we can of the figures now available. The roughness, the uncertainty, and the limited scope of the conclusions drawn here show how much we need fuller and more accurate data concerning the occupations of the people, the regularity of their work, their products in physical terms and in dollars, their money incomes and living expenses. Particularly do we need a national census of merchandising comparable in scope with the current census of manufacture.

[From the New York Globe, June 9, 1922.]

#### DOES PROSPERITY PASS AROUND?

It is customary to assume that manufacturing industry has bettered the fortunes of the worker. Changes have been so numerous and this generation is so much under the spell of the idea of progress that it is all but universal to say that conditions have improved. It is not at all clear, however, that workers have gained materially during the past generation. In fact, tangible evidence points in the opposite direction.

Last March George Soule, of the Labor Bureau, published a study in the Annals, which has been summarized as follows:

1. The production of wealth in the United States, reckoned not in dollars but in tons, yards, bushels, and similar physical units, has been increasing faster than the population.

2. The census of manufactures shows that from 1899 to 1914 wage earners received an almost constant share (about 41 per cent) of the value added by manufactures; that is, an almost constant share of the addition which factories make to the value of the raw materials they handle.

3. But all studies of real wages indicate that the physical quantity of food which the factory workers could buy with their wages decreased from 1899 to 1914.

Wesley C. Mitchell and W. I. King, two of the most competent economists and statisticians in the country, tested by an independent study Mr. Soule's findings. Mr. King certainly is as conservative as Mr. Soule is liberal, and accordingly there is little likelihood of a desire on the part of the experts to confirm each other's work. Yet, as Professor Mitchell shows in an article published by the Evening Post, Mr. Soule's conclusions have been substantially confirmed.



The illusion that the fortunes of the workers have improved is due largely to the general rise in prices. Nominal wages have increased while actual wages have not. In 1889 the average full-time wage of a factory worker was \$444.8 a year. By 1899 this had become \$518. Twenty years later it was \$1,161.90, a handsome increase if men ate dollars. But measured by an unchanging dollar, say that of 1913, the situation is not so rosy. By such a standard a worker could buy \$635 worth of food in 1889, \$627 worth in 1899, \$582 in 1909, and the peak of wages in 1919 only \$625 worth.

During the last 33 years American factory workers seem thus to have gone backward rather than forward. So far as they are concerned, prosperity has not been passed around. The fact that it has not has created the industrial problem which can never be dismissed until it is solved with reason and with justice.

MSA 21317

END OF  
TITLE